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THE WIA RADIO AMATEUR'S JOURNAL

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AMATEUR RADIO

THE WIA RADIO AMATEURS JOURNAL

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EXECUTIVE EDITOR
Bill Rice VK3ABP

MANAGING EDITOR
Graham Thornton VK3IY

NEWS EDITOR
Jim Linton VK3PC

SENIOR TECHNICAL EDITOR
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MARKETING
Bruce Kendall VK3WL
Norm Eyres VK3ZEP

ADVERTISING
Ann McCurdy

All contributions and correspondence concerning the content of Amateur Radio should be forwarded to: -
The Editor
Amateur Radio
PO Box 300
Caulfield South
VIC 3162

Registered Office
3/105 Hawthorn Road
Caulfield North VIC 3161

Telephone: (03) 528 5962
(03) 523 8191
Fax: (03) 523 8191
(Non dedicated line)
Business hours: 0930 to 1500

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CONTENTS

Technical

General

Columns

Cover

Two examples of Sterling Mark 1 spark transmitter, from the collection of Bill Babb VK3AQB, featured to mark the 75th anniversary of ANZAC day. Transmitters of this type were used, and maintained, by Bert Billings, who is the subject of Jim Linton's article "The Last Wireless ANZAC" on page 32. The Sterling Mark 1 transmitted artillery information from observing aircraft. It used an induction coil, condenser and spark gap supplied

Continued on page 33

Back in the Chair

The moment of truth has once again arrived, and a further editorial is called for! It was a pleasant respite last month to hand over the space to Jim Linton but, for the time being, the supply of guest editorialists seems to have dried up! I have just finished writing the Publications Committee Annual Report, which you will find elsewhere in this issue, so the typewriter is running hot! Time I traded it in on a word processor perhaps?

If you look back through past issues, you will see that at this time every year I have been preoccupied with preparations for the annual Marlay Point Overnight Sailing Race. This year is no exception, but it may well be the last in which we attempt to make our sow's ear of a slow catamaran into the silk purse of a racing thoroughbred! Oh, well, back to Lake Eyre in another month or two, if there's enough water; but, on that score, the hoped-for summer rains seem not to have been too generous.

Regarding lake trips, I was asked recently how the special QSLs were coming along for those who worked us while on Lake Eyre South or Lake Torrens last October. The answer is, far too slowly! The printing of a small number (probably under 100) of special photographic cards is not without problems, but I do hope to have time to attend to it before long.

This issue does not carry an Awards column by Ken Gott VK3AJU. Ken had done an excellent job as Federal Awards Manager for several years, but had suffered serious heart trouble in recent months. Even so, we were all shocked to hear of his sudden death early in March. *Le roi est mort, vive le roi!* Who will be the next Awards Manager? And Ken will be sorely missed at our monthly proof-reading sessions also, at which he invariably checked his own column very thoroughly, as well as proofing a good deal of other material.

On that sad note, it would seem that anything further would be inappropriate. Perhaps there will be more and more pleasant things to write about next month.

NEWS EDITOR'S COMMENT

BILL RICE VK3ABP EXECUTIVE EDITOR

Phone Patch Warning

Articles on phone patch appearing in various magazines have featured Line Isolation Units (LIU) and given advice on the subject of interconnection between Telecom's switched network and radio equipment.

Intending constructors are advised that modifications to any authorised LIU are generally not permitted without them having been submitted to Austel for approval. Caution should be taken not to alter the LIU as approved, in any manner, including the use of alternative or substitute components, or different wiring or construction techniques.

The WIA LIU published in Amateur Radio magazine, September 1987, is authorised for use on the Telecom switched network. This article gives full details on how to build the WIA LIU and have it approved. ar

Support the WIA in order to protect Amateur Radio frequencies at WARC 92

Wireless Institute of Australia

The world's first and oldest National Radio Society - Founded 1910
Representing Australian Radio Amateurs - Member of the International Amateur Radio Union
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All mail to: **PO Box 300, Caulfield South, Vic, 3162** Telephone: (03) 528 5962 (03) 523 8191
Fax: (03) 523 8191 (Non-dedicated line)
Business Hours: 9.30 am to 3.00 pm on Weekdays

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WIA NEWS

BILL ROPER VK3ARZ GENERAL MANAGER & SECRETARY

RF Tag Ident System

On page 4 of the November 1989 issue of Amateur Radio magazine, it was reported the WIA had been asked by DoTC to comment on a proposal to permit RF identification devices to be used in Australia without being individually licensed.

The proposal covered VLF, HF, VHF/UHF and microwave bands. The proposed frequency band that was of immediate concern to the WIA was 3.5 to 3.95 MHz. As reported in November 1989, the proposed field strength limits in the 80 metre band would lead to noise powers well in excess of the CCIR man made noise predictions. This was definitely unacceptable to the Australian amateur service.

The WIA responded to DoTC and also commented that it must gazette a standard for the RF ID system.

The response, a result of considerable work by Ron Henderson, VK1RH, achieved a good result. DoTC recently replied with a revised proposal for the HF devices that reduced the proposed field strengths from 15 microvolts per metre at 30 metres, to 1 microvolt per metre at 30 metres, explaining that this level now equated to the CCIR man made noise predictions for quiet urban areas.

The WIA has responded to this new proposal, indicating the proposed new field strength is now acceptable, but reiterating WIA concern that a DoTC standard be gazetted before the RF tag system comes into service.

An article seen recently in an Australian computer newspaper described the application of RF ID devices to the stock taking of shipping containers in storage parks. On interrogation each container so fitted would "beep" back its' unique digital identification code for direct entry into the PC based container inventory system.

WIA and Standards Australia

A member of Executive recently heard several members of a HF net decrying on air the apparent lack of involvement by the WIA in Standards' matters.

He knew of the considerable involvement in Standards work by the WIA, and at first could not understand why these amateurs were soundly criticising the WIA with such ill-informed and disparaging comments.

However, upon reasoned reflection, he came to the conclusion that this uninformed public comment was perhaps another instance where low profile members of the WIA, although working diligently for the betterment of the amateur service in Australia, are not having their efforts adequately publicised.

For the record, the WIA has been very actively involved on Standards Association of Aus-

WIA DIVISIONS

The WIA consists of seven autonomous State Divisions. Each member of the WIA is a member of a Division, usually their residential State or Territory, and each Division looks after amateur radio affairs within their State.

Division	Address	Officers			Weekly News Broadcasts	1990 Fees
VK1	ACT Division GPO Box 600 Canberra ACT 2601	President Secretary Treasurer	Ted Pearce Jan Burrell Ken Ray	VK1AOP VK1BR VK1KEN	3.570 MHz 2m ch 6950 70cm ch 8525 2000 hrs Sun	(F) $65.00 (G) (S) $52.00 (X) $39.00
VK2	NSW Division 109 Wigram St Parramatta NSW (PO Box 1066 Parramatta) 2124 Phone (02) 689 2417 Fax (02) 633 1525	President Secretary Treasurer (Office hours	Roger Henley Peter Balnaves David Horsfall Mon-Fri 1100 - 1400 Wed 1900 - 2100)	VK2ZIG VK2CZX VK2KFU	(R Denotes repeater) Times 1045 and 1915 on Sunday 1.845 MHz AM, 3.595 SSB (1915 only), 7.146 AM (1045 only) 10.125 SSB (1045 only), 28.320 SSB, 52 120 SSB 52.525 FM 144.12 (SSB), 147.000 FM(R) 438.525 FM(R) 584.750 (ATV Sound) 1281.75FM (R) Relays also conducted via many repeaters throughout NSW.	(F) $59.00 (G) (S) $47.00 (X) $33.00
VK3	Victorian Division 38 Taylor St Ashburton Vic 3147 Phone (03) 885 9261	President Secretary Treasurer Office hours 0900-1600 Tue & Thur	Jim Linton Barry Wilton Rob Hailey	VK3PC VK3XV VK3XLZ	1.840 MHz AM, 3.615 SSB, 7.085 SSB, 147.250 FM(R) Mt Macedon, 147.225 FM(R) Mt Baw Baw 146.800 FM(R) Mildura, 438.075 FM(R) Mt St Leonard 1030 hrs on Sunday	(F) $65.00 (G) (S) $52.00 (X) $39.00
VK4	Queensland Division GPO Box 638 Brisbane Qld 4001 Phone (07) 284 9075	President Secretary Treasurer	David Jones John Aarsse Eric Fittock	VK4NLV VK4QA VK4NEF	1.825, 3.605, 7.118, 14.342, 18.132, 21.175, 28.400, MHz 52.525 regional 2m repeaters and 1296.100 0900 hrs Sunday Repeated on 3.605 & 147.150 MHz, 1930 Monday	(F) $65.00 (G) (S) $52.00 (X) $39.00
VK5	South Australian Division 34 West Thebarton Rd Thebarton SA 5031 (GPO Box 1234 Adelaide SA 5001) Phone (08) 352 3428	President Secretary Treasurer	Don McDonald Hans van der Zalm Bill Wardrop	VK5ADD VK5KHZ VK5AWM	1820 kHz 3.550 MHz, 7.095, 14.175, 28.470, 53.100, 145.000, 147.000 FM(R) Adelaide, 146.700 FM(R) Mid North, 146.900 FM(R) South East, ATV Ch 34 579.00 Adelaide, ATV 444.250 Mid North (NT)3.555, 146.500, 0900 hrs Sunday	(F) $65.00 (G) (S) $52.00 (X) $39.00
VK6	West Australian Division PO Box 10 West Perth WA 6005 Phone (09) 474 2626	President Secretary Treasurer	Alyn Maschette Bruce Hedland - Thomas	VK6KWN VK6OO	146.700 FM(R) Perth, at 0930 hrs Sunday, relayed on 3.560, 7.075, 14.115,14.175, 21.185, 28.345, 50.150, 438.525 MHz Country relays 3582, 147.350(R) Busselton 146.900(R) Mt William (Bunbury)147.225(R) 147.250 (R) Mt Saddleback 146.725(R) Albany 146.825(R) Mt Barker Broadcast repeated on 3.560 at 1930 hrs.	(F) $56.00 (G) (S) $45.00 (X) $30.00
VK7	Tasmanian Division PO Box 1010 Launceston TAS 7250	President Secretary Treasurer	Mike Wilson Bob Richards Peter King	VK7ZWW VK7NRR VK7ZPK	146.700 MHz FM (VK7RHT) at 0930 hrs Sunday relayed on 147.000 (VK7RAA), 146.750 (VK7RNW), 3.570, 7.090, 14.130, 52.100, 144.100 (Hobart) Repeated Tues 3.590 at 1930 hrs	(F) $63.00 (G) (S) $50.00 (X) $38.00

VK8 (Northern Territory) is part of the VK5 Division and relays broadcasts from VK5 as shown (received on 14 or 28 MHz).

Note: All times are local. All frequencies MHz.

Membership Grades
Full (F) Pension (G)
Needy (G) Student (S)
Non receipt of AR (X)

Three year membership available to (F) (G) (X) grades at fee x 3 times

tralia committees for many years, and is a subscribing member of that association. The previous WIA Standards Co-ordinator, Alan Foxcroft, VK3AE, was, as the WIA representative, Chairman of SAA Committee TE/3, which was examining the issue of Standards on Immunity.

Representatives of the WIA have been attending meetings of SAA Subcommittee TE/14/4 - Siting of Radiocommunications Facilities for some time now. The WIA has a particular interest in this subcommittee because of repeater co-siting with commercial facilities.

Recently SAA Subcommittee TE/14/4 completed and circulated for postal vote a draft standard relating to the siting of satellite earth stations. After postal voting, the draft will be released for public comment.

Disposal News Items

During 1985 the then DOC became concerned about the increasing practice in several Divisional news broadcasts of advertising equipment for sale. Although DOC argued at the time that this was an improper, commercial use of amateur communications, never-theless it eventually agreed to the practice continuing, on **authorised WIA news broadcasts only**, and under certain conditions.

However, for a variety of reasons, in several Divisions, the practice of including "disposals news items" in broadcasts has increased and altered to the extent that DoTC now feel it has become blatantly commercial and they must withdraw the facility.

A DoTC letter of 11th December 1989 to the WIA foreshadowed the withdrawal of the Disposal News Items facility and stated the DoTC reasoning. The WIA protested this action in the strongest possible terms, and the matter was placed on the agenda for the next Joint Meeting.

As a result of intense discussion and negotiation at this WIA/DoTC Joint Meeting held in Canberra last Friday, 16th February 1990, DoTC agreed to withhold any action in this matter for a short time provided that:-

1. The WIA acted immediately to ensure that any disposals news items included in official WIA news broadcasts are strictly in accordance with the terms of the 1985 agreement; and

2. The WIA submits, within two months, a proposal for long term continuance of the facility, including the setting of clear parameters for news broadcasts by the WIA and others.

Work has already commenced on the proposal for long term continuance of the facility. However, it was very obvious to those representing the WIA at the 16th February 1990 Joint Meeting that the WIA has little chance of retaining this facility unless each Division of the WIA immediately "cleans up" its' act and reverts strictly to the terms of the 1985 agreement.

The broad guidelines of that 1985 agreement are:

- disposal news items must only relate to amateur equipment offered for personal disposal by the amateur concerned (that is, advertisement by commercial organisations is not permitted);
- only one official WIA representative as contact officer for all disposal items is to be utilized;
- no pecuniary gain is to be received by the WIA in connection with any advertisement;
- disposal news items may include prices, at the discretion of the individual Divisions of the WIA; and
- this approval applies to authorised WIA news broadcasts only. It should not be taken as a general precedent that may be adopted for use by the whole amateur fraternity.

Stolen Equipment Register

The Stolen Equipment Register maintained by the WIA was published on pages 29, 30 and 31 of the February 1990 special data reference issue of Amateur Radio magazine. To minimise the possibility of typesetting errors, the database was provided to the printers of the magazine in ASCII on computer disk.

But the gremlins, and the proofreaders, still managed to confuse the issue.

The seventh column of data from the left hand side of the published Register, which is headed "Recovered" is incorrect, and should be crossed out. All the items listed in that published Register are still unrecovered!

The dates that were published in that column are, in fact, the dates that the stolen equipment notices were published in Amateur Radio magazine. They should not have been published in this edition of the Register.

Also, the heading of the next column, which relates to any unusual features of the stolen equipment, should simply have read "Comment".

This Register is very important, particularly if you are contemplating acquiring any second hand amateur equipment, so please ensure that you alter your copy immediately.

Anti-Social Repeater Behaviour

One of the many subjects discussed in the 16th February 1990 WIA/DoTC Joint Meeting was the problem of illegal transmissions on amateur repeaters, and the correct procedures to be followed when this occurs.

DoTC observed that, all too often, exasperated amateurs transgressed just as badly as these rather sick people in the manner in which they reacted to these illegal transmissions.

The correct procedure with these illegal transmissions is to **totally ignore them!** Under no circumstances should you respond or comment in any way on a transmission that is not identified by a legal callsign.

The psychologists tell us that if you respond in any way to such anti-social behaviour, the perpetrator has achieved what his warped mind seeks, may well believe his actions have been justified, and will be encouraged to continue his abnormal behaviour. Ignore him totally, and eventually he will go away.

"Second Operators"

Judging by the questions that come into the Executive Office from time to time, there seems to be some confusion about the operation of amateur stations by non-licenced people.

"Can the unlicenced person operate the station equipment as long as the licencee is in the general vicinity, or should the licencee be with the equipment at all times?" "Is it legal for an unlicenced person to announce the callsign on a club station?" "What is a "second operator"?"

Basically, clause 17 on page 6 of DOC 71:-

"The licensee, if permitting an unqualified person to transmit by voice from the station, shall be physically present to supervise and control all operations."

and clause 25 on page 8 of DOC 71 :-

"Where a person who does not hold an appropriate certificate is transmitting from the station, in accordance with paragraph 17, the licensee shall signify his/her presence and control by announcing call signs in the prescribed manner."

say it all.

The unqualified person may manipulate the equipment and make contacts, **provided** the licenced operator is physically present to announce callsigns, etc.. That is, he/she is close enough to see and hear everything that is happening, and be in a position to be able to assume immediate control of the station and the contact if warranted.

There is no such thing as a "second operator". That is just a bit of amateur "folk lore".

Revised Spectrum Plan

A revised radio frequency Spectrum Plan was published in the Commonwealth of Australia Government Notices Gazette On 28th February 1990, and radiocommunications users were invited to comment.

This draft Spectrum Plan sets out the broad allocations for all radio frequencies in Australia.

The Spectrum Plan in current use was produced in 1982, and DoTC maintains that it needed updating because of:

1. international radio frequency allocations made by ITU world conferences from 1983 to 1988 in regard to short wave broadcasting, maritime, aeronautical, land mobile and satellite services; and
2. developments in Australian communications to meet the needs of aviation, defence, business and private users that continue to evolve with the introduction of new services.

The WIA has received three copies of the 602 page draft Spectrum Plan and is currently examining it closely to see if there are any proposed changes that may impinge on the Amateur Service in any way.

Should it be necessary for the WIA to make a submission, we have until 31st May 1990 to put our views to DoTC.

Awards Manager Needed

As a result of the untimely death of Ken Gott, VK3AJU, the WIA has a vacancy for the position of Federal Awards Manager. If you are interested in certificate hunting and awards, and can spare a few hours a week, this could be an opportunity for you to help your fellow amateurs, and the WIA.

In the first instance, it is probably desirable that the Federal Awards Manager be located in Melbourne, and be able to call at the Executive Office in North Caulfield from time to time. However, this is not essential, and the position could be filled by a person located anywhere in Australia.

If you are interested in helping out with Federal Awards, and you would like to know more about the vacant position, please contact me at the Executive Office, during the office business hours, by telephoning (03) 528 5962.

In the meantime, if you have applied for an award, please be patient until a new Federal Awards Manager has been apointed and settled into the job.

WIA 80 AR For Non Members

One of many initiatives that the WIA is offering during 1990 to celebrate its 80th Birthday, is a limited, once only offer of a four month subscription to Amateur Radio magazine for non-members of the WIA.

This four month subscription to AR will be for the May to August 1990 issues of the magazine and will cost just $12.00. The subscription includes the cost of postal delivery of the magazine, and must be received in the Executive Office no later than 30th April 1990 in order to qualify for this offer.

If you have a friend, or know of someone who should be a member of the WIA, here is a chance to introduce them to our magazine and the WIA on a trial basis.

1990 Federal Convention

The 1990 Federal Convention of the WIA will be held at Normanby House in Melbourne on the weekend of 21st and 22nd April 1990. Normanby House is a facility, associated with Monash University, which provides conference and dining facilities together with residential accommodation.

Elsewhere in this issue of Amateur Radio magazine the WIA has published those annual reports that were received on or before 5th March 1990.

Make sure you read them. All parties involved were advised of this closing date for publication, even though the legal closing date for these items to be included in the 1990 Federal Convention is 23rd March 1990.

At the closing date for copy, no agenda items had been received from the Divisions.

What is a "Federal Convention"?

"Federal Convention" is just another name, enshrined in the Articles of Association, for the Annual General Meeting of the Federal Body of the WIA.

Each Division of the WIA is a separate body, with its own constitution. The Federal Body of the WIA only has seven members, the seven Divisions. The nearly 8000 members of the WIA are not members of the Federal WIA, but are members of one or other of the various state Divisions.

The Federal Body consists of the Federal Council (a representative appointed from each of the seven Divisions, who are known as **Federal Councillors**), the general management group known as the **Executive** who are appointed by the seven Divisional representatives on Federal Council, and the **Executive Office** that carries out the day to day work of the Federal Body under the control of the Executive.

Currently, Executive consists of the seven Federal Councillors plus five others.

It could be accurately said that the Federal Body of the WIA solely exists as a vehicle created by the Divisions to bring about some unification of the seven Divisions of the WIA, by determining policy in those areas that affect the whole of Australia and not just one state, by liaising on behalf of the Divisions as one voice with Government, and by providing those member services, such as publishing of Amateur Radio magazine and membership fee processing, which can be most cost efficiently carried out on behalf of the Divisions by a central body.

Under the present structure of the WIA, the Divisional appointees to the Federal Body meet three times a year in addition to the Federal Convention/Annual General Meeting.

From this rather basic explanation of the structure of the WIA I trust you now realise that, as a member of the WIA, you and your views are to be represented at this 1990 Federal Convention. And that the person acting on your behalf is your Divisional Federal Councillor.

Do you know who your Federal Councillor is?

If not, have a look at the WIA Directory on page 3 of this magazine.

Do you feel strongly about the WIA and the future of amateur radio as a hobby? Do you want your views represented at the 1990 Annual General Meeting of the WIA?

Then make sure you contact your Federal Councillor and let him know your point of view.

Video Tape Library

Complete details of the WIA Videotape Library were included on pages 31 to 33 of the February 1990 Special Data Reference Issue of Amateur Radio magazine. Everything, that is, except the address at which to contact the Federal Videotape Co-ordinator.

John Ingham, VK5KG, is the WIA Federal Videotape Co-ordinator, and can be contacted by writing to 37 Second Avenue, Sefton Park, South Australia, 5083.

Repeater Cross Linking

Members will remember the uproar late last year relating to the cross linking of repeaters. Following consideration of the ruling from DoTC of 10th October 1989, and submissions from a number of amateurs, repeater groups, and WIA Divisions, it quickly became clear that there are several difficulties with the Department's response on the use of tone access for repeater linking.

Here, in some detail, is the proposal put to DoTC by the WIA at the 16th February 1990 WIA/DoTC Joint Meeting.

The aim of this paper was to present the WIA's position on access control for amateur radio repeater links, and to recommend a course of action.

Traditionally, amateurs have been able to determine their own standards and the marketplace has often dictated which ones become popular and which ones fall by the wayside. Further, the trend in the hobby of amateur radio is towards deregulation.

Nevertheless, the WIA acknowledges that within the broad DoTC regulatory constraints there is the need for agreed amateur operating standards. The WIA, as the representative national body carries out consultation to develop these guideline standards.

In the case of amateur radio repeaters, there is a need for a number of access and control mechanisms. Some, which have been in service for many years, include:

- time out timers,
- control of repeater functions, including remote shut-down,
- extension of time out and initiation of specific linking for WIA broadcasts and WICEN,
- miscellaneous repeater housekeeping, including change of antennas, power sources etc.

Discussion has already taken place on the possibilities of using sub-audible tones to minimise the effects of co-site interference.

These controls have been generally implemented by the use of audio frequency tones superimposed on the transmitted signal. Several techniques are available and employed internationally by the amateur community. These include:

- audio tone burst,
- continuous tone carrier sub-audible squelch (CTCSS)
- dual tone multi frequency (DTMF)

Each of these existing techniques has particular merits and associated disadvantages, depending on the purpose for which they are employed.

The WIA has noted the DoTC concern over the possibility of linked repeaters allowing an amateur station's transmissions to be re-radiated on frequencies for which that station is not licensed. The WIA fully supports these concerns and accordingly has spent considerable time analysing the issues.

The WIA agrees with the DoTC viewpoint that an amateur operator should not be inadvertently re-transmitted beyond the terms of his licence. This leads to the WIA position, which we believe is supported by the Department, that an amateur operator must take a conscious and deliberate action to invoke a facility that would not be permissible for some grades of licensee.

Further, the WIA supports the DoTC position that control means must be open and achievable by all suitably licensed amateurs. To this end the WIA believes that appropriate published standards are adequate for our needs and that these should be promulgated as appropriate in amateur literature.

The WIA believes that linking control is only necessary where the potential exists for an amateur to breach the terms of his/her licence. Consequently, the WIA would see access controls only being implemented on those repeaters which have this potential. The WIA observes that there will be many situations where out-of-licence transmissions cannot occur and access control is not necessary.

Potential exists through access control of repeater links for selective routing and potentially sophisticated networkings. Further, extended repeater control and housekeeping functions also fall within this category. We believe that these controls remain the prerogative of the repeater licencee and provided that they work within the regulatory requirements, the techniques used are of no great concern to the regulatory authority.

DoTC is aware of the experimental nature of the Amateur Radio Service. In keeping with that tradition, and observing a

wide variety of equipment exists capable of being utilised for access control, the WIA would not support mandatory adoption of any particular technique. Rather, repeater operators and users should be free to choose from available techniques the means which best meets their requirements while complying with all of the regulatory constraints.

Any proposals adopted and implemented now should not lock the amateur service into techniques that become obsolete in just a few short years. Traditionally, amateur equipment has a cycle life of five and fifteen years between major updates.

The WIA recommends that:

1. Repeater link access controls only be required when access to that link may lead to a breach of regulations by the operator, due to frequency limitations of the class of license held.

2. Such links be controlled by the use of a tone access signal on the originating transmission.

3. The mode and frequency of such tone access signal conform to current guidelines established by the WIA.

4. These guidelines, see below, be reviewed from time to time to take into account advances in technology.

5. Current practices and DoTC co-ordination requirements continue, such that tone access signals conform to current WIA guidelines and be approved by the appropriate Technical Advisory Committee prior to licensing by the DoTC.

Tone Access Control Guidelines

1. Repeater link control will only be necessary where activation of a linked repeater may lead to a breach of licence conditions by a user (eg AOLCP using a 2m repeater linked to 10m).

2. Where control of a repeater link is required, the method of access to the link is by the application of audio frequency tone(s).

3. CTCSS is the preferred means of access control.

4. DTMF is the preferred means for repeater control functions, such as repeater house keeping and technical management and is not recommended for access control of repeater links.

5. The sense of the access control is such that application of tone(s) is necessary to activate any link.

6. Three modes of tone access are currently available:

   i) Tone Burst
   ii) CTCSS
   iii) DTMF

7. Preferred frequencies for these modes are:

i) Tone Burst: 1750Hz - established European tone.

ii) CTCSS: EIA standard tones (Hz)

67.0	94.8	141.3
69.3	100.0	146.2
71.9	103.5	151.4
74.4	107.2	156.7
77.0	110.9	162.2
79.7	114.8	167.9
82.5	118.8	173.8
85.4	123.0	179.9
88.5	131.8	186.2
91.5	136.5	192.8

iii) DTMF: Bell standard

		High Tone		(Hz)
		1209	1336	1477
Low	697	1	2	3
Tone	770	4	5	6
(Hz)	852	7	8	9
	941	*	0	#

DoTC is presently considering this submission from the WIA, and a response is expected shortly. **ar**

Jindalee Radar For QLD

Australia's northern defence will get a boost with the siting of a Jindalee over-the-horizon radar station in central Queensland.

A station requiring two sites, one for the transmitter and the other for the receiver, will be in the Longreach area, 1000 km north west of Brisbane. It will be part of a network of three stations to provide for the first time the detection of all ship and aircraft movements in Australia's northern approaches.

The Australian-developed Jindalee radar uses HF radio signals refracted by the ionosphere to detect moving objects beyond the horizon. **ar**

THE TRANSISTOR AS A VOLTAGE AMPLIFIER

LLOYD BUTLER VK5BR
18 OTTAWA AVE PANORAMA 5041

Introduction

With today's state of the art, the operational amplifier package is well established as a means of obtaining voltage amplification and knowledge of how to design discrete transistor amplifiers for this purpose might seem unnecessary. Notwithstanding this, discrete transistor circuits are still needed at frequencies above the range of the operational amplifier and for certain special applications such as low noise amplification where a discrete transistor can often be made to perform better than the amplifier package.

In the paragraphs which follow, we will discuss factors which determine the gain of the transistor voltage amplifier and we will discuss an established method of determining the component values in the transistor circuit. The discussion will concentrate on the usual resistance capacity (RC) method of coupling and include such effects as loading by the following stage. The discussion essentially concerns the bipolar transistor but it will also extend to a problem in RC coupling the field effect transistor.

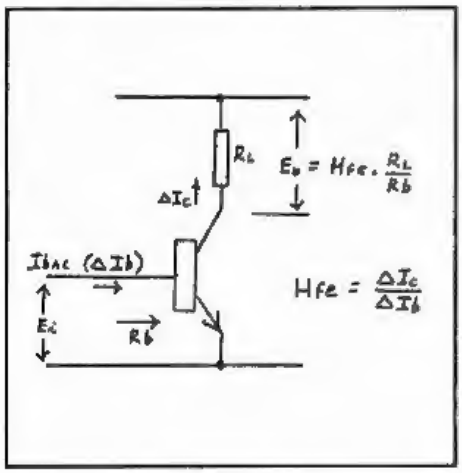

Figure 1. Transistor as voltage amplifier

Current Transfer Ratio Hfe And Stage Gain

If you were to select a bipolar transistor for an amplifier to obtain maximum voltage gain, you might be tempted to select one with the highest current transfer ratio Hfe. In fact, this would be of no avail as voltage gain is essentially dependent on two factors, namely the emitter current (Ie) and the output load resistance (RL), but not Hfe. On the other hand, a high Hfe could increase the voltage gain of the previous stage. If these statements have astounded you, then just read on.

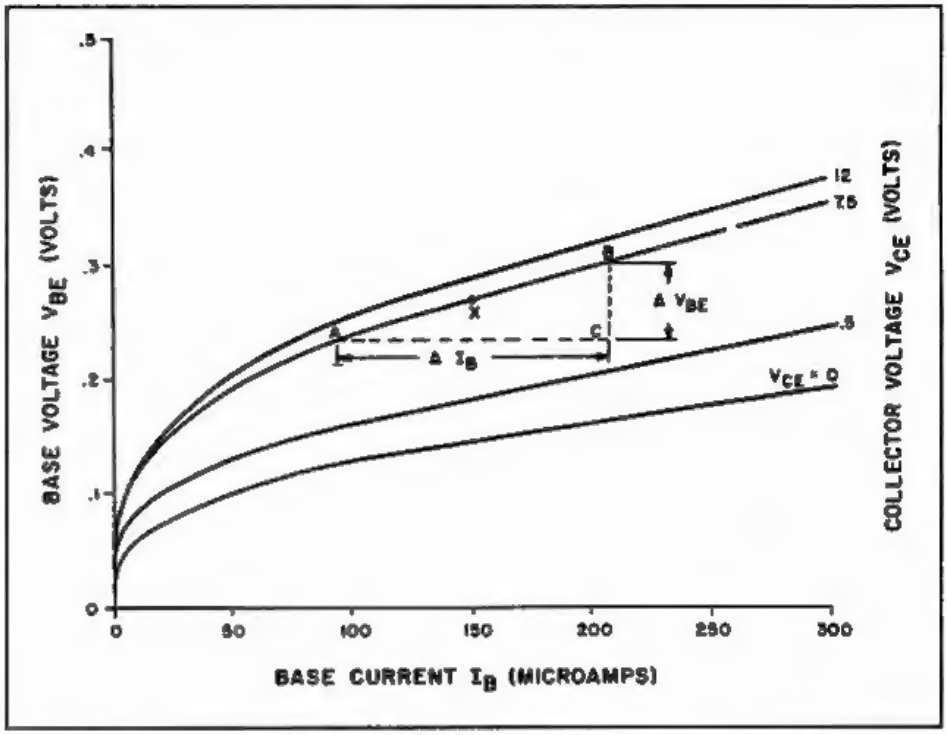

Figure 2. Base voltage VBE as a function of base current IB for a germanium transistor

Figure 1 is a representation of the transistor operating as a voltage amplifier. The AC output voltage (Eo) is equal to the AC current at the collector multiplied by the load resistance (RL) and the AC current at the collector is equal to the AC current at the base (Ibac) multiplied by Hfe, ie:

Eo = Ibac. Hfe. RL .....(1)

The AC current at the base is equal to the AC input voltage (Ei) divided by the transistor input resistance (Rb), ie:

Ibac = Ei/Rb .....(2)

Substituting (2) in (1) we get:

Eo = (Ei. Hfe. RL)/Rb

& voltage gain Av = Eo/Ei = (Hfe.RL)/Rb .....(3)

Based on expression (3), voltage gain is clearly dependent on Hfe, but let us now examine Rb. According to theoretical text books, the input resistance (Re) of a common base connected transistor is derived as follows:

Re = (K.T)/Q.Ie)

where K = Boltzmann's Constant
T = Absolute Temperature
Q = Charge of an Electron
Ie = Emitter Current in mA

At room temperature this works out to Re equal to about 25/Ie.

For common emitter connection, input is to the base and input resistance is Rb. Base current equals collector current (or emitter current) divided by Hfe and hence, with near constant voltage across the base/emitter forward biased junction, input resistance (Rb) is multiplied by Hfe. Thus we get:

Rb = (25.Hfe)/Ie .....(4)

To illustrate the variation of AC base resistance with variation in base current (Ib = Ie/Hfe), figure 2 is shown. Observe how the slope of the curves (and hence the value of Rb) decreases as the base current is increased. Rb is given by the ratio of change of voltage base/emitter (Vbe) to change in base current (Ib).

If we now substitute expression (4) for Rb in expression (3), we get a further

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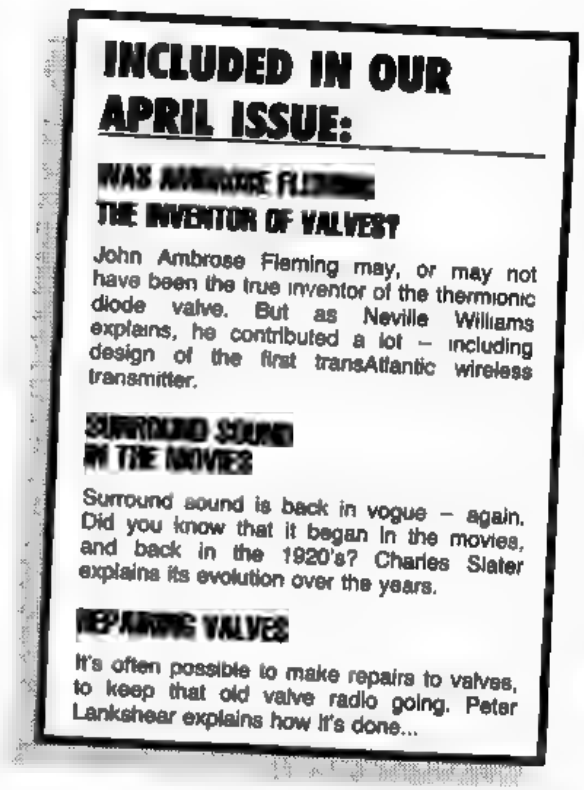

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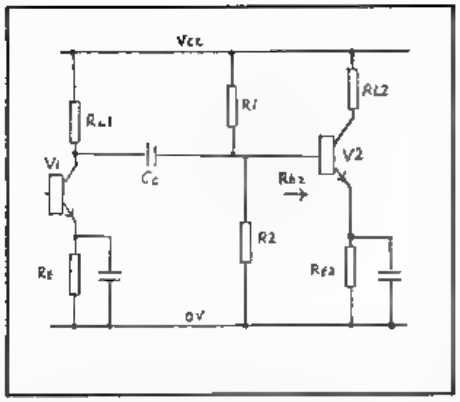

Figure 3 Effective load resistance of stage V1 is the parallel result of RL, R1, R2 and the base resistance of V2 (Rb2)

expression for voltage gain:
Voltage gain Av = (Hfe.RL.Ie)/(25.Hfe)
Hfe is cancelled out so that:
Voltage Gain Av = (RL.Ie)/25 .....(5)

Observe that calculation of voltage gain now only involves the values of RL and Ie and not Hfe, so that our first point has been proved.

The Previous Stage

As a further exercise, let us examine the amplifier stage shown as V2 in figure 3. Referring to previous paragraphs, we have seen that its voltage gain is independent of Hfe but we have also seen in expression (4) that Rb is directly related to Hfe and a low Hfe means a low value of Rb.

We now examine the gain of the previous stage V1. The collector load resistance of this stage is the parallel result of collector resistor RL1, the V2 stage base bias resistors R1-R2 and the input resistance Rb of V2. Rb is normally the lowest value making it the main factor in setting the load resistance of V1. Referring back to expression (5), we see that, for a given value of Ie in V1, the voltage gain of V1 is controlled by its load resistance which is essentially the value of Rb in V2. A high value of Hfe in V2 gives a high value of Rb in V2 and this is reflected as high gain in V1. This confirms the second point which was made earlier

Circuit Design

Design of a transistor voltage amplifier stage, as shown in figure 4, is really quite simple Resistors R1 and R2 form a voltage divider which sets the base reference voltage Resistor Re provides DC feedback to stabilise the emitter current and hence the operating point of the transistor. Resistor RL is the collector load resistor

The first thing is to decide on what emitter current should be used A current of around 1 mA is usually quite satisfactory for audio amplification unless there is some special reason for selecting otherwise. If a low noise level stage is required, such as that following a low level high impedance microphone, a lower current might be desirable. On this subject, the reader is referred to an article by the writer entitled "Amplifier Noise" published in Amateur Radio, November 1985. On the other hand, a higher current is often required at higher frequencies and this will be discussed later.

The next decision is to select an emitter voltage (Ve). The higher this voltage, the greater is the emitter current stability in the presence of temperature variation and for variation in the value of Hfe. A value of Ve around 1 to 2 volts is normally satisfactory. If the supply voltage (Vcc) is around 12 volts, one might select Ve = 2V. For Vcc = 6V, a value of Ve = 1V might be as high as one can go. Calculate resistor Re as follows:

Re = Ve/Ie

Now work out the voltage at the base. For a germanium transistor, this is close to 0.2 V higher than that at the emitter. For a silicon transistor, this is close to 0.7 volt higher than that at the emitter. Of course, this differential is simply the forward voltage drop across the base to emitter diode junction.

The base current is equal to the collector current (or emitter current) divided by Hfe. (Note that collector current is nearly equal to emitter current.) The idea is then to bleed a current through the R1-R2 divider about 10 times the base current so that the base voltage is held constant, almost independent of the base current. We calculate the resistance values as follows:

R1 = (Vcc — Vb)/(10 Ib)
= Hfe. (Vcc — Vb)/(10.Ie)
R2 = Vb/(9.Ib)
= (Hfe.Vb)/(9.Ie)

The reason why R2 calculation is divided by 9.Ib and not 10.Ib is that one tenth of the current is passed into the base itself

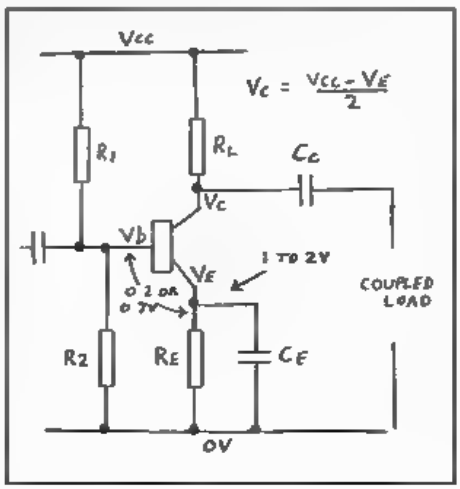

Figure 4. Stabilised amplifier stage.

All we have to do now is to work out a value for RL so that the operating point is set correctly. As far as the signal is concerned, the available supply voltage is (Vcc — Ve) and to make use of equal voltage swing either side of the operating point, the collector voltage Vc is set half way between Vcc and Ve. For RL, we calculate as follows

RL = (Vcc — Ve)/(2 Ie)

Operation is illustrated in figure 5 by the load line A for RL. Observe that the operating point is set at half the available supply volts.

Effect Of Coupled Load

As discussed previously, one effect of a coupled load, such as a following transistor, is to lower the effective load resistance and lower the gain of the stage. Another effect is to lower the maximum signal voltage swing which can be achieved. This is demonstrated in figure 5 by load line B for the total parallel load.

One way to increase the maximum signal voltage swing is to lower the value of RL. This of course means a circuit design around a higher value of collector current

Another way to increase the maximum signal voltage swing is to reduce the signal loading by coupling via an emitter follower stage as shown in figure 6. The follower is characterised by high input resistance which reduces the signal loading. It also provides a low resistance signal source to drive an output circuit or another stage

The Field Effect Transistor And RC Coupling

From our previous discussion, the operational collector voltage is correctly set by selecting the collector load resistance RL for a voltage loss equal to half the available supply voltage In the circuit of figure 4, the collector current is precisely set by the values of R1, R2 and Re and virtually unaffected by any spread in the bipolar transistor characteristics. With the field effect transistor (FET), the use of RC coupling can present quite a problem when a load resistance is placed in the drain circuit. Drain current is set by the bias voltage applied to the gate of the FET and unfortunately the drain current versus gate voltage characteristic of the FET varies from sample to sample of the same transistor type. If a resistance loaded drain is used, gate bias must be set to suit the individual transistor.

At radio frequencies, the drain resistor can be avoided by coupling via an RF choke, transformer primary or tuned circuit in series with the drain

The Capacitors

To complete our discussion on the design of the basic circuit (figure 4) we still have to select the capacitors. Resistor Re is used to provide DC feedback for stabilisation of the operating point but this must be by-passed by capacitor Ce to prevent negative feedback at signal frequency. A good rule is to select the value of Ce such that its reactance is not greater than one tenth of the value of Re at the lowest frequency of operation.

Capacitor Cc provides DC isolation between the collector circuit and the following load circuit or following stage. Its capacitance value is selected such that its reactance is not greater than the reflected load resistance (perhaps the base resistance of the following stage), at the lowest frequency of operation. If equal to that resistance, it will give 3 dB loss at that frequency to form the low frequency pole.

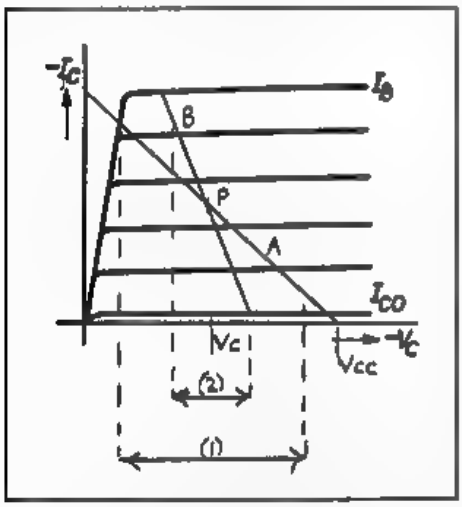

Figure 5 Load lines for amplifier stage. A = Load line for collector resistor (RL) only — (Maximum signal voltage swing (1) approaches half supply voltage) B = Load line with coupled load — (Maximum signal voltage swing (2) is reduced)

High Frequency Operation

It was stated earlier that a collector (and emitter) current of around 1 mA was generally suitable for audio frequency voltage amplifiers. At higher frequencies, collector current has to be increased. The reason for this is that the value of load resistance RL must be lowered to make it low relative to the shunt capacitive reactance, inherent at the transistor

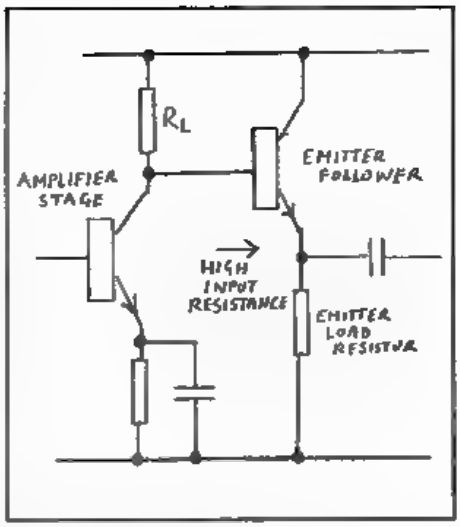

Figure 6. Emitter follower reduces signal loading.

output and at the following stage input. As frequency is increased, the shunt reactance becomes lower and hence RL must also be made lower. To maintain collector voltage at half the available supply voltage, collector current must be increased with proportional decrease in the values of R1, R2 and Re. Referring back to expression (5), gain is lost by the lower value of RL but this is compensated by the increase in Ie.

In the previous paragraph, we have been specifically discussing RC coupled stages with an implication of wideband operation. At radio frequencies, we might choose to tune the amplifier and incorporate the shunt capacitance as part of the tuned circuit so that a high load impedance is formed to provide higher gain. As our subject is essentially about RC coupled stages, we will not dwell further on that particular application.

The Emitter Follower

The emitter follower is a very useful special form of voltage amplifier. It has high input resistance, low output resistance and a gain just less than one. Its input resistance is approximately equal to the load resistance at its output circuit multiplied by Hfe. If base stabilising resistors are used as shown by R1 and R2 in figure 7, these must also be considered as part of the input resistance in parallel and in fact when used, are usually the main input resistance determining factor.

Output source resistance is approximately equal to the resistance of the source driving the follower stage divided by Hfe. In calculating the output source resistance, resistors R1 and R2 must also be taken into account as being in parallel with the input source. If the follower stage is RC coupled from a previous col

Continued from page 11

The Transistor As A Voltage Amplifier

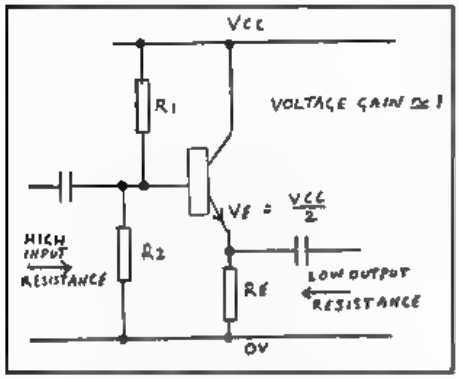

Figure 7 Emitter follower

lector circuit, the collector load resistor can be taken to be the source resistance as the inherent output resistance of a common emitter stage is very high by comparison to the value of that resistor.

Calculation of R1 and R2 is the same as described previously for the common emitter amplifier except that base voltage Vb is made equal to half the supply voltage (Vcc) plus the base to emitter diode voltage (0.2V for germanium and 0.7V for silicon) Emitter voltage is then equal to half Vcc to enable equal signal voltage swing either side of the operating point and Re = Vcc/2Ie.

The problem of the coupled load limiting the signal voltage swing still applies to the emitter follower stage and the choice of emitter current (Ie) depends on just what value of coupled load resistance must be driven and how much signal voltage is required across that resistance. For low resistance coupled loads, quite a high emitter current is often required with low values of Re, R1 and R2 and consequently a high power dissipation transistor.

Defining A Fixed Stage Gain

Negative feedback can be used on any amplifier to achieve a defined stage gain. Providing the gain with feedback is a low value compared with that without feedback, the gain is set purely by the components which determine the proportion of feedback. This principle is well established in the application of operational amplifiers. In the case of the single transistor stage, the feedback can be achieved by removing the emitter bypass capacitor or dividing the emitter resistor into two separate components, only one of which is bypassed as shown in figure 8.

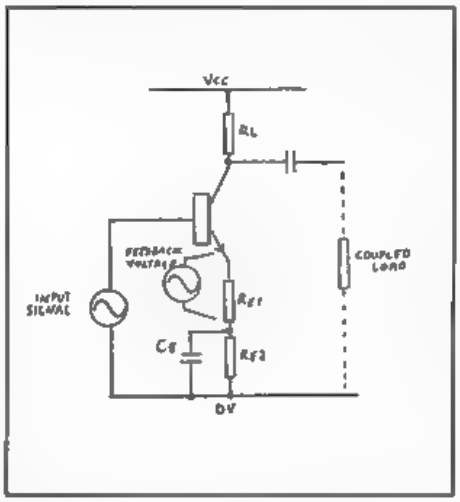

Figure 8 Amplifier with defined stage gain.

Providing the resultant gain is small compared to that without feedback, voltage gain is equal to the ratio (Rel + RLt)/ Re1 The value RLt is the effective load and the parallel result of RL and the coupled reflected load To determine the values of Re1 and Re2, calculate as follows:

Re1 = RLt/(Af — 1)

where Af is the desired gain

Re2 = Re — Re1

where Re is the value calculated to set the emitter current to the desired figure.

Stable voltage gains, defined by Re and RLt are achievable up to a value of around 10. Above that, transistor gain within the amplifier loop is insufficient to maintain dependence only on the feedback factor and the gain with feedback is then also a function of the amplifier gain without feedback, ie

Af = A/(1 + B.A)

Where A – gain without feedback
and B = the feedback factor or proportion of feedback

Voltage & Power Amplification

The definitions of voltage amplification and power amplification go back to the days of valve amplifiers. The basis of these definitions is that in class A operation, the valve does not consume power at its control grid and the requirement is to supply signal voltage rather than signal power to its grid. The last stage is a power amplifier because it must supply power to the loudspeaker or other load All the previous driver stages are voltage amplifiers, their function being to raise the signal level sufficiently to drive the power amplifier. Field effect transistor amplifiers, with their high input resistance, can be considered in the same light but the writer could well be taken to task in defining the bipolar transistor stage as a voltage amplifier when it is required to drive another bipolar transistor stage. The transistor is driven by signal current and hence the following stage consumes power. If one must be pedantic, the previous stage could well be considered as a power amplifier. Notwithstanding this, the circuit analysis discussed has been carried out on the basis of stage voltage gain and as such, the coupled stages have been considered as voltage amplifiers. This analysis concept then makes it compatible with analysis for the FET amplifier, the valve amplifier and operational amplifier circuitry.

Summary

A short discussion has been presented on the transistor voltage amplifier with particular reference to resistance capacity coupling. Included in the discussion is the calculation of stage gain and a method of deriving component values in the amplifier circuit. Also included are the effects of a coupled load on gain and maximum signal voltage swing and an introduction to the emitter follower and stabilised gain amplifiers. **ar**

T Plug Connection Convention

In answer to the question posed by Tim Mills VK2ZTM on P54 of AR Feb 90

Rotate plug or socket until pins or receptacles resemble an upper-case letter "T" The horizontal connector resembles a minus sign, and is indeed the negative terminal

CONTRIBUTED BY LAY CRANCH VK3CF

ar

EQUIPMENT REVIEW - THE KENWOOD TM-231A 2m FM TRANSCEIVER

RON FISHER VK3OM
"GAALANUNGAH" 24 SUGARLOAF RD BEACONSFIELD UPPER

It's been quite a while since we reviewed a full-featured two-metre mobile transceiver, and it seems that there is always something of a shock when they arrive. The first impression is that they just cannot put out the amount of power that they do for the amount of space they take up. The 50-Watt output transceivers are now smaller than the 25-Watt rigs of only a few years ago.

Having said that, let's look more closely at the transceiver in question. The TM231A is an FM only transceiver, which covers the two-metre band from 144 to 148 MHz. Maximum power output is rated at 50 Watts, with selectable lower power of either 10 or 5 Watts. The overall size is 140mm wide, 40mm high and 160mm deep. Overall weight is just 1.2kg. The transceiver is supplied with a mobile mounting bracket, a DC power cable a little over two metres in length, and fitted with a two-pin automotive connector and three fuses. Yes, you did read that correctly, there are two in the positive lead and one in the negative lead. The supplied microphone has, in addition to the now usual up/down buttons, four buttons on the front to select the call channel, VFO operation, memory operation and a programmable function key which I cover later in the review. There is also the usual PTT button on the side and a lock switch on the rear. All in all, the microphone is a rather unusual looking device; however, it does perform its primary function very well.

The rather small front panel contains a total of 14 controls, many of which have two selectable functions, but most of the area is taken up with a very clear LCD multi-purpose display. This shows frequency, memory channel, offset, relative power output, receive "S" meter, on-air indicator, control lock, reverse operation, priority alert function, low or medium power selection, plus several other status indications. Most of these are of reasonable size for fixed station operation, but you might have trouble picking them up while mobile. The display is well illuminated in a cream colour, as are the three control knobs and the three buttons above the VFO/memory selector knob. The six small buttons under the main display have a tiny illuminated dot on them to give you a better chance of hitting them at night. The whole effect is quite attractive.

As the photos show, most of the overall size is taken up with the heat sink, and, as we will later see, this is all needed. In order to provide more heat sink area, the SO-239 RF output connector is on a flying lead about 20cm long. Apart from the DC power cord, the only other connector on the back panel is for an external speaker. The built-in speaker is mounted inside the top cover of the transceiver, which might be either good or bad depending on how you wish to mount the rig in the car. Perhaps it might have been better if Kenwood had stuck to the earlier idea of not putting a speaker into the rig, but providing an external unit instead. I would suggest that in most mobile situations an external speaker would be very worthwhile.

The mobile mounting bracket is of a new simplified design and allows for three different mounting angles. Special screws clamp the transceiver to the bracket, and a wrench is supplied to tighten them.

As might be expected, memory and scanning facilities are included. There are 20 memory channels.

When in the VFO mode, tuning steps are selectable. You can set up 5, 10, 12.5, 15, 20 or 25 kHz steps, and, of course, the 25kHz is ideal for our band plan, and allows easy stepping up and down the FM portion of the band.

The TM231A on the Air

At the outset, I would suggest that if the transceiver is to be used primarily for mobile operation, you will save a lot of time and confusion by programming up the memories you need and sticking to them. A quick glance at the display to determine the operating frequency is probably about all the time you can safely take your eyes off the road. However, for base station use, you can let your head go and push the buttons to your heart's content

Right, back to the beginning. First thing I did was to program the VFO for 25kHz steps. This makes it easy to zip up and down the band and also saves the embarrassment of landing on a non-standard channel and perhaps causing interference. But again, I am getting ahead of things One of the nice features is the power on/off switch. No more turning up and down the audio volume control, there is a separate push button right in the top right-hand corner — very easy to find. This is one of the best I have seen and, of course, allows the audio to be preset at the right volume

Talking about the volume, audio output appeared to be reasonable using the internal speaker, but again I would like

to make a point. If it's easy to provide 50 Watts of RF output, why is it so hard to provide more than a couple of Watts audio output? I think the time has come when we should have at least 10 Watts of UNDISTORTED output. WHY NOT! By the way, this also applies to base station transceivers Received audio quality was also acceptable, but a good sized external speaker is really required to make the most of the very good audio that the rig can produce.

I set the transceiver up on the desk alongside my old Kenwood TR-7950, both coupled to my antenna through a two-position coax switch. Both of these transceivers have roughly the same specifications, but are about six years apart in manufacture. The most noticeable difference is that the TM231A is about half the overall size. One wonders what might happen over the next six years. Actually, I couldn't pick much difference between the two. The sensitivity of the new TM231A measured just one dB better.

Transmitted audio from the TM231A was rated as excellent with the supplied microphone and broadcast quality when I connected my MC-60A desk mic.

Getting on top of the operating procedures might take you a while, but the instruction book describes everything very well. Let's go through some of the excellent facilities.

The 20 memory channels are arranged so they can be programmed in a variety of ways. First, channel one can be used to store the frequency for the priority alert function.

Channels 15 and 16 can be used to store the lower and upper limit frequencies for the programmable band scan function, and channels 17 to 20 can be used to store repeater frequencies with odd splits. I don't know of any of these, mind you, but if you do come across any you won't be left out in the cold.

Scanning of the memory channels is available in several modes. Firstly, the scan may be carrier operated, or you can set up a time-operated scan. Let me explain the difference. If you just want to check for activity around either programmed memories or the whole band, the timed scan will stop for about five seconds then carry on to the next busy channel With the carrier-operated scan, the transceiver will pause until the station you are listening to actually stops transmitting Next, if one of the local repeaters is full of rubbish (and that's a likely situation), it's possible to lock that channel out of the scan and then quickly re-instate it later if required.

Several interesting options are offered with the TM231A. Unfortunately, none was included with our review transceiver. However, let's run through them, and hope that one day we might be able to obtain some from Kenwood and review them separately. Unfortunately, not a lot of information is supplied about them in the instruction book.

First, three external loudspeakers are available. Two, the SP-41 and the SP-50B, are for mobile use, and the SP-430 for base station use. The SP-430 is, of course, the matching speaker for the TS-430/440 HF transceivers. A total of six different microphones is available for either mobile or base station use, plus RC-10 remote controller This intriguing device allows full remote control of the TM231A with the rig placed perhaps

The Kenwood TM 231 A – Although not normally a "hand held" transceiver, this shows how compact the unit really is.

TM 231 A Microphone Note remote control button and 'Mic' input hole above.

The TM 231 A – Note the large LCD multi purpose read out.

under the seat or in the glove box.

Another option I would like to try out is the DRU-1 digital recording unit. This enables you to pre-record and then replay up to eight short calls. It also is capable of recording incoming messages, and if used in conjunction with CTCSS (also an option), you could arrange for a friend to leave a short message even if you are not in the shack.

The TM231A on Test

First of all, the transceiver was connected to a 13.8-Volt DC power supply, and tests for power output and current drain were carried out. The following results were obtained.

	Power Output	Current Drain	% Efficiency
High	52 (Watts)	9.1 (Amps)	41
Medium	10 (Watts)	4.3 (Amps)	16.9
Low	5 (Watts)	3.1 (Amps)	11.8

Clearly, modern high-powered transceivers show greatest efficiency at high power output. If current drain is an important consideration, then you might be better off to look at one of the older transceivers that could typically put out 10 Watts at about two Amps drain, which offers over double the efficiency at 10 Watts

Receiver current drain was 300MA with no audio output, peaking to 500MA at full audio output. I imagine that most of this was caused by the dial lights.

With this sort of power input and output on transmit, you might imagine that the heat sink gets rather hot after a long over. It does!

Next, I checked out the receiver. First audio power output and distortion. The receiver output was terminated with both four Ohms and the specified eight Ohms. At eight Ohms, the maximum was 3.6 Watts with just on 12 per cent distortion. At 4 Ohms, the maximum output improved to 4.6 Watts with distortion at 10 per cent. The actual discriminator distortion is very good at only one per cent measured at 1kHz with 3kHz deviation.

Receiver sensitivity was next checked and found to be somewhat better than specification. SINAD was measured at 12dB for an input of .12uV, specified at 12dB for .16uV.

Lastly, the "S" meter calibration was checked. The "S" meter consists of a series of bars on the LCD display. There are 10 up to the S9 mark and four slightly larger bars for S9+. Overall, the bars are slightly larger than many current transceivers and, therefore, easier to read at a reasonable distance.

The "S" meter calibration is as follows (in Microvolts):

S3	S5	S7	S9	S9+
0.56	1.6	2.2	3.2	5.7

The TM231A Instruction Manual.

Well, at least you can brush up on your Spanish, French, German, Dutch and sundry other European languages while you study the English section. Two hundred and twentyseven pages of instruction manual actually finish up with about 43 pages of readable material What there is, is well written, with clear instructions on how to master the operating system. As is, unfortunately, the norm these days, there is no technical information included, apart from two circuit diagrams. There is one for the TM231A/E and one for the TM531A/E, which is the 1200MHz version.

I find it unfortunate that not even basic adjustment information on, say, the microphone gain or deviation setting is included. After all, we don't all speak at the same level Actually, as far as I can see, there is no microphone gain control, only a deviation preset.

However, I imagine that Kenwood will have a service manual available, and I would suggest that new owners might consider purchasing one.

The TM231A Conclusions

There is no doubt that the TM231A is an excellent little transceiver. It does everything that can be expected of it and does it very well. And, of course, it has that extra that comes with all Kenwood transceivers — Kenwood audio quality on both transmit and receive. At its present price, the TM-231A is one of the best-value two-metre transceivers on the market. My thanks to Kenwood Electronics Australia for the loan of the review transceiver. **ar**

MODIFICATIONS TO DICK SMITH EXPLORER 430 MHz TRANSCEIVER

ALLEN CREWTHER VK3SM
28 REYNOLDS PDE PASCOE VALE STH 3044

If, after having assembled the Explorer kit, the transmitter section won't function, here are a few ideas that I have used to put some units on the air.

1. Make sure that all the capacitors, transistors and coils are hard down on the board. A very short length of lead is a lot of inductive reactance at these frequencies.
2. Capacitors C103, 163, 164 & 166 must be small NPO type (ie have a black dot on the top). They were not supplied in some kits. (NPOs are also called for in the VCO circuit.)
3. All coils must be correctly wound as per the instruction book and the height of the hairpin coils must be as shown, a suitable drill bit under the loop when soldering will check for you.
4. The voltage at the collector of Q1 should be +10 ± 0.1V. It can be adjusted by changing R4 and R5. A low voltage here can be a problem in getting the crystal oscillator to work.
5. The 8.5333 MHz crystal is generally high in frequency. Add up to 10 pF to C144 to correct it.
6. When adjusting the transmitter section, do NOT hold the PTT button for MORE THAN A FEW SECONDS at a time as Q25 may fail.
7. Up to TP4 no trouble should be encountered and the correct levels should be obtained but often no reading can be seen at TP5. If this is the case, try items 8, 9 and 10.
8. REMOVE R99 from across C108.
9. REMOVE C104 (39 pF). (These mods will cause Q14 to operate in the correct tripler mode.)
10. Return to TP4 and readjust, then move to TP5. Now, there should be sufficient drive to permit lining up the rest of the transmitter section
11. A good point to check the frequency with a counter is at C57, position F10.

The operating frequency will be:-
— Receive F(counted)X 3 + 10.7 MHz.
- Transmit F(counted) X 3 MHz

Once it is on the air, you will (or may) get reports that it is off frequency. This is not the trouble; it is the microphone supplied. Get a better one or do the following modification.

Fit a 10 k 1/4 W resistor from the 10V TX link near the microphone socket to the spare contact on the socket. In the microphone disconnect the microphone element and fit an electret element snuggled in a piece of foam Rearrange the wires to follow the circuit shown in Fig 1. Across the microphone socket bypass the 10k resistor with a 10 µF electrolytic capacitor.

This mod will improve your audio and hopefully eliminate the "off frequency" reports.

On one unit here the audio amplifier on the receiver failed. In this case, I adopted the easy way out and pulled out all the amplifier components and replaced them with an LM 380 on a small matrix board. The circuit and layout is shown in Fig 2.

Good luck and see you on 430. **ar**

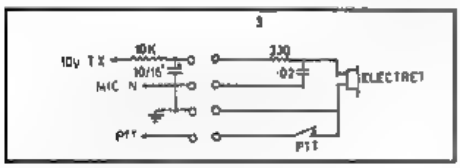

Fig 1. Microphone rewire

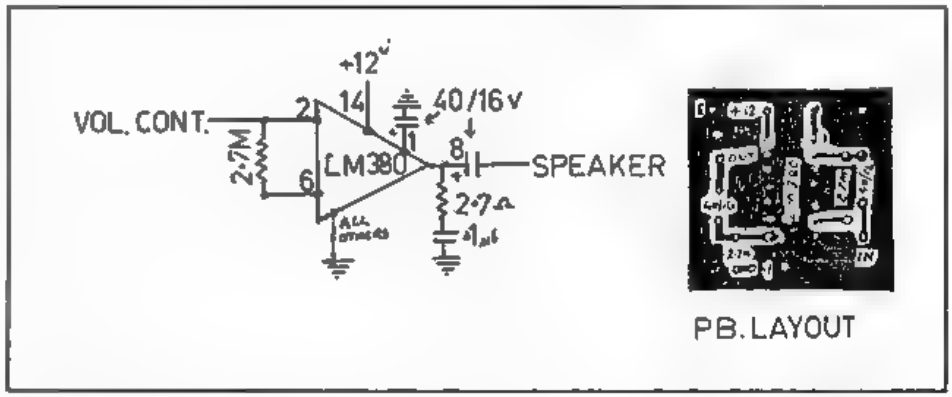

Fig 2 Audio amplifier.

Try This
Ribbon Revival

I read with interest the paragraph in Bits 'N' Bytes concerning the aerosol cans of ribbon reviver. I too had seen advertisements for this product and was considering buying some as I get through a large number of ribbons on my printers.

A few months ago one of my two printers packed up so I summoned a repairman. After he had repaired the printer I asked him for his opinion on this reviver. After a chuckle he said that this was rather expensive in his opinion. The trick he and many others in the trade use is the ubiquitous WD40 lubricating fluid at £1.89 a can. The method he gave is as follows:-

1. Remove the lid of the ribbon cartridge and from about 12 inches lightly spray the ribbon in the box. Also wind in the portion of ribbon outside the box and spray that.
2. Leave the lid off overnight and replace the following morning.

I have tried this and it works very well indeed, allowing about 5 doses before the ribbon is finally exhausted.

He also stated that no harm would be done to the printer or print head and in fact the WD40 lubricated the pins in the print head.

For information, the gentleman concerned was, before retirement, an engineer for Epson (UK).

BRIAN LONNON G3ZUM

(RP7 seems to work too – Ed.)

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See A.R.A review Vol 12, issue 5

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Cat K-6349

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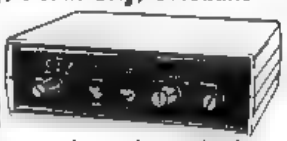
Morse/RTTY Decoder Kit



— This kit can be hooked-up between the audio output of a receiver and a dot matrix printer, and will decode and print out most Morse or RTTY transmissions without using your computer Features both narrow and wide filters for RTTY, a digital section based on a Z80 microprocessor running at 4MHz, and a Morse decoding program which self-tracks from around 5WPM to 40WPM Kit includes AC plugpack and a pre-punched/screened front panel.

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DICK SMITH ELECTRONICS

MEASUREMENTS ON LARGE ELECTROLYTIC CAPACITORS

REG FOOKES VK2AKY
19 DELAGOA PLACE CARINGBAH 2229

Introduction

The advent of fully solid-state transceivers and power amplifiers has brought the need for high-current, low-voltage regulated power supplies. Purchasing one ready-made off the shelf can severely deflate the bank account, so many amateurs elect to build their own. After the transformer, the most expensive component is the reservoir capacitor. Surplus computer power supplies are a common source of supply, and although normally of premium quality, it would be re-assuring to be able to check the basic parameters of capacitance and DC leakage current. DC leakage current is accepted as an indicator of the condition of an electrolytic capacitor; when the rated maximum value is exceeded the capacitor is assumed to be "outside limits" and unserviceable. The extra internal heating caused by the high current can create a thermal runaway situation, leading to physical, explosive destruction of the unit. Although not a comprehensive check-out, these two measurements should suffice for power supply components.

Measurement of the leakage current is relatively simple, but the capacitance is a little more difficult. The average digital capacitance meter or bridge stops at about 100 µF, while the values used in the power supplies are normally tens of thousands of µF, and even up to 100000 µF.

The unit to be described will measure capacitance values of these magnitudes as well as the DC leakage current. It will also re-form the dielectric film of electrolytic capacitors which have been idle for long periods. The techniques used are about as close to first principles as one is likely to get.

Principles Involved

Consider Figure 1. When the capacitor, C, is fully charged the voltmeter will register the full supply voltage, Vo. If the switch, S, is moved from position 1 to 2, C will commence to discharge through R and the voltmeter will indicate the falling voltage. If a stop watch is started as S is changed and simultaneous values of voltage (v) and time (t) recorded, and these plotted on linear graph paper a curve of the form shown in Figure 2 will result.

The curve has several interesting features. The maximum slope is at t = 0, and although the slope always decreases as t increases, it never reaches zero, and while the curve approaches closer and closer to the horizontal axis it never reaches it. In other words, the graph goes on for ever.

The general equation for curves of this form is:

$$y = ae^{-bx}$$

where e is the base of natural logarithms (2.71828...) and a and b are constants. It is commonly called an exponential equation and qualitatively describes many natural phenomena, including radioactive decay, the temperature of a cooling object and the intensity of a beam of radiation traversing an absorbing medium.

In the case of Figure 1 the equation is:

$$V = V_o e^{-t/RC}$$

V and V_o are expressed in volts, t in seconds, R in ohms and C in farads.

This expression has the useful feature that at the instant when V = 0.368 Vo, t is numerically equal to RC. (A justification for this statement is offered in the Appendix). Hence, by knowing R and measuring the time for V to decrease to 36.8% of its initial value, C is readily calculated.

As a point of interest, the current through R follows the same form of curve as the voltage across it, the equation being:

$$I = I_o e^{-t/RC} \quad \text{where } I_o = V_o/R$$

So the timed decay of I could also be used to measure C. Disadvantages of this method include the measurement of small currents (down to a few microamps), and it will not be taken further.

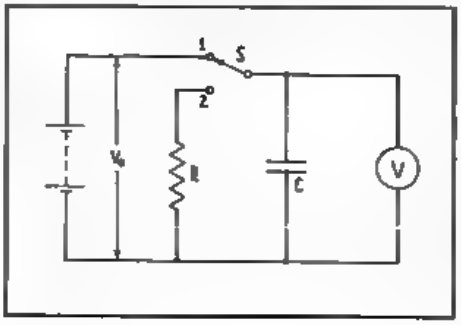


Figure 1

Returning to the first method, a few minutes with a calculator will show that the technique is not really practical for values of C in the pF and nF ranges, but if R is 1MΩ and C is a few tens of µF the situation changes — each second represents 1 µF, and intervals of 20 or 30 seconds are easily timed to ± 5%. At the other end of the capacitance range, say 100000 µF, the decay time with R = 1MΩ would be 100000 seconds, or nearly 28 hours. Clearly, a range of values of R is necessary.

To accommodate different capacitor voltage ratings a variable voltage power supply is required for Vo, and to measure the DC leakage current a suitable meter needs to be inserted between the power supply and the switch, S.

To complete the set-up, a stop watch is required to perform the timing operation.

The Real World

The preceding discussion assumed all the circuit elements to be perfect, ie C was pure capacitance — neither series nor shunt resistance — and in the case of electrolytic capacitors this is never the case. There is not much we can do about series resistance, except to hope that it is not large enough to be significant. Except for very old specimens this is usually a valid assumption. The shunt resistance will produce a current which continues to flow after the capacitor is fully charged, and because it is in parallel with the measuring resistor R, will result in a lowered measured value of C. Normally the error will be negligible, and in any case, if the leakage current is excessive the capacitor should be discarded.

The voltmeter should ideally have infinite input resistance, but this also is impractical. The voltmeter resistance, being in parallel with the capacitor shunt resistance, will increase the indicated leakage current and also reduce the measured value of capacitance. However, since it is usually known, allowance can be made for it. A problem noticed with DVM's when indicating a changing voltage is the display time lag. With a "Fluke 75" DVM I have found that the timed interval should not be less than about 70 seconds.

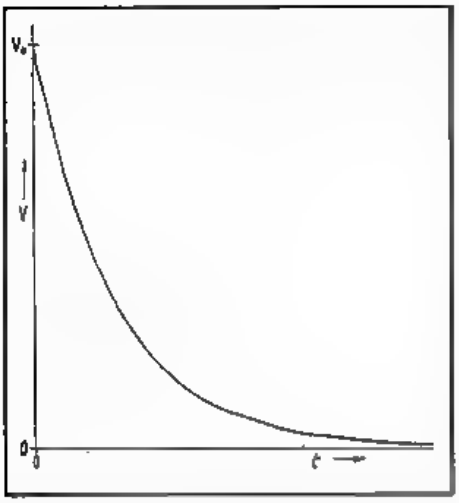


Figure 2

The voltmeter input resistance should be constant for all ranges. VTVM's, FET-input voltmeters and DVM's usually fulfil this requirement. In addition their resistance is normally 10 MΩ, an acceptably high value.

Ordinary multimeters are unsuitable.

The Circuit

Figure 3 is the circuit diagram of the device. This is a project that certainly can be assembled from junk box components — as mine was.

The power supply section need only be capable of a few milliamps. Its voltage will depend on the maximum capacitor working voltage decided upon. One hundred Volts seemed a reasonable choice and allowed the use of a gaseous voltage stabiliser. Although not strictly necessary, stabilisation permits a steady DC leakage current reading.

VR1 and VR2 should be 2W wirewound units. Although not common these days they can still be found, especially in junk boxes.

The voltage applied to Cx, the capacitor under test is set by VR1, while VR2 limits the current during the re-forming and charging operations

The charging and leaking currents are measured by the current meter, M1, with its associated shunts and range switch. The SC (short circuit) position is a safety feature to protect the meter during repeat capacitance measurements, as described in the Operation section. The diode D1 across the meter provides back-up protection in case of operator forgetfulness. The current range switch is a 2-pole, 5-position rotary wafer type, with the two sets of contacts paralleled to reduce contact resistance

An external analogue multimeter with suitable current ranges would be quite suitable here instead of a built-in meter.

The CHARGE-MEASURE SWITCH, S is a SPDT toggle with a fast snap action.

Any one of the four test resistors, R, is selected by a suitable rotary switch. Assuming that the voltmeter input resistance is 10MΩ, only the 1MΩ range will be significantly affected by it. This is compensated by increasing the 1MΩ resistor to 1.1MΩ.

Good insulation in the whole measuring circuit is necessary.

Operation

As well as the basic circuitry of Figure 3, one will need a suitable voltmeter, as previously discussed (DVM, VTVM etc.), a stopwatch and preferably a pocket calculator.

With VR1 at minimum voltage, VR2 at minimum current (maximum resistance) and M1 set to a suitable range (see later) connect the voltmeter and Cx, the capacitor to be tested

Slowly advance the voltage and current controls so that Cx voltage rating is not exceeded and the current is within the limits specified later. As Cx approaches the fully-charged condition the current should fall to a low value and the applied voltage will probably have to be reduced to avoid exceeding its voltage rating.

If Cx has been discharged for a long period — as long as two years for good computer grade units, as short as three months for some older types — manufacturers recommend that the dielectric film be reformed by slowly increasing the applied voltage so that the charging current never exceeds twice the rated maximum DC leakage value. The voltage should be held at the rated level for four hours (Philips 1962), if your patience allows. During this time the current should fall to a constant level — the DC leakage current. The rated maximum value is quoted (Philips 1962) as:

I = 0 08 CV μA at 20° C, (C expressed in μF.)

For a capacitor in good condition a value of about 20% of this would be expected.

A leakage current greater than the rated maximum indicates that the capacitor is unserviceable.

Improved manufacturing techniques have reduced the leakage current, and the quoted maximum limits were halved in 1963, and then halved again in 1965 (quoting from Philips literature). So a knowledge of the capacitor's age is desirable.

For low values of leakage current remember to subtract the current flowing through the voltmeter, or temporarily disconnect it.

Assuming Cx has passed the DC leakage test, its capacitance may now be measured.

Note the (steady) voltmeter reading and calculate 0.368 of it. To save time and effort a table or graph giving 0.368 Vo against Vo can be made.

Select a value of R to give an expected decay time of about 100 seconds. For R=1MΩ each 1μF represents one second, for R = 100kΩ each 1μF equals 0.1 seconds, etc.

When all is ready simultaneously flip S from CHARGE to MEASURE and start the stopwatch. Watch the voltmeter and as its reading passes through the calculated value stop the watch.

The capacitance of Cx in μF is found by multiplying the stopwatch time in seconds by the multiplier corresponding to the selected value of R — 1 for 1MΩ, 10 for 100kΩ, 100 for 10kΩ and 1000 for 1kΩ.

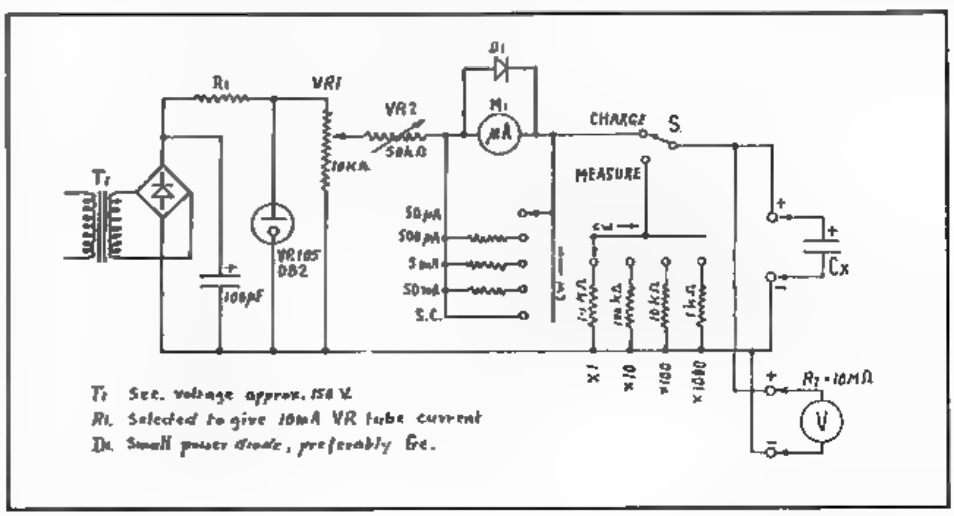


Figure 3

Continued on page 20

THE TNC-220+ OPERATING FACTORS AND MODIFICATIONS WHEN USED IN A DIGI-PEATER

By John F Drew VK5DJ
34 Aitken St Millicent 5280

The TNC220+ is an Australian version of the TNC220. It has been put out by the Melbourne Packet Radio Group in kit form and as ready built boards. At the time it was an excellent and economical way of getting on packet, the boards are of good quality and the kit is easy to build with an excellent construction manual that contains clear building and setup instructions.

The unit makes use of the PacCom program in ROM and because this is used in at least two other designs, owners are not likely to be left with an obsolete unit. In fact, since buying my kit there have been two program updates which are compatible with the 220+. The second and third versions (1.1.6 & 1.1.6a) offer personal message systems which, although not able to forward mail like the MBL program, do offer a very useful message system. Such a system satisfies 90% of amateurs' needs and doesn't clog up the full blown BBSs.

A number of digi-peater operators are either using or have used the TNC220+ as the TNC in a digipeater. The unit is a fine piece of equipment for use at home, but unfortunately some problems have arisen.

The first thing to remember is that the TNC was designed for home use where it is expected that all the input and output lines will be tied to the proper places.

Firstly, pin 4 of the TNC220+'s output connect must be tied high or tied to pin 5 so that the receive buffer does not overflow. Later versions of the manual pointed this out.

Secondly, some operators have left the receive data, pin 2, floating. No input should ever be left floating. When connected to a computer terminal in normal use, this pin is held low. The simplest fix is to wire a 6k8 resistor between the negative 10V available on pin 5 of U2 (the 7662 is a voltage inverter) and pin 2 trace of the RS232 connector on the board. This holds the input pin in the case of VK5RPM at -3.7V. Ideally the voltage should be a bit more negative than this and a 4k7 may be better. In our case the modification was done on site and the digi had to be re-installed in order to try it. It was too much bother to take it all out to get to the section in order to try different values!

Continued on Page 21

Measurements On Capacitors

Continued from page 19

The capacitance tolerance on electrolytic capacitors can be as wide as +100%, — 20%, but is usually stated on the capacitor. Any measured value within these limits would be acceptable. A significantly low value indicates rejection.

A repeat measurement, perhaps with a more appropriate value of R, can be made by returning S to the CHARGE position after reducing the applied voltage to a low level and selecting the S C position for the current meter. The voltage is then raised to the rated value as before and the measurement procedure repeated.

The foregoing discussion has concentrated on the electrolytic capacitor as it is the most common type for capacitances greater than 100µF, but the theory and techniques are applicable to other types

For anyone interested in quite comprehensive information on electrolytic capacitors, from the Philips organisation's point of view, there were a number of articles in the "Miniwatt Digest" series. These are listed in the References. Similar data would also be available from other manufacturers, and from technical literature.

Other Uses

Although designed to measure large values of capacitance this device has other uses, such as a low-current power supply and a test set for zener diodes.

To do this connect the diode to the Cx terminals, observing polarity, adjust the voltage and current controls, as for a capacitance measurement, so that the specified test current flows through the diode, and the zener voltage will be displayed by the voltmeter.

The dynamic resistance can be determined by taking current and voltage measurements at several points on the voltage plateau, plotting the results and drawing the straight line of best fit. The dynamic resistance is then given by:

$$R_D = \frac{\Delta V}{\Delta I}$$

Conclusion

Unlike a sophisticated black-box type instrument, where one connects the item under test, maybe sets a range switch, and then reads the required parameter on a digital display, this piece of gear has to be "driven", rather like an old fashioned bridge, with due regard for what is going on. The two danger areas are "twanging" the current meter and exceeding the voltage rating of the capacitor.

On the credit side it is simple, versatile and capable of very good results.

Appendix

Since the equation $V/Vo = e^{-t/RC}$ is of exponential form, t/RC will have all values from zero to infinity (t, R and C all being positive, real numbers).

Therefore at some instant t/RC will be numerically equal to unity.

For this to be so t must equal RC.

At the same instant V/Vo will equal e^{-1}, which is 0.36788...

References.

Miniwatt Digest articles.

Vol	No	Date	Page
1	7	Apr 1962	110
2	11	Aug 1963	169
3	3	Dec 1963	45
5	1	Oct 1965	10
5	3	Dec 1965	43
6	10	Oct 1967	156

ar

The reasons for using a resistor rather than hard wiring is so that a computer will still work the RS232 without any switching Most computer outputs will probably drive lower impedances but you'd have to experiment. As it is, the impedance is about 3 kohms (the 6k8 resistor and the 7k drive impedance of the interface chip are in parallel) and it works fine.

This latter fix is necessary because, when the input floats, I suspect RF is detected and somehow jams up the Z8530 SCC

I'm not convinced that it is just a case of receive buffer overflow although it may be. Anyway, this simple installation step is the most essential of the steps to stop the TNC220+ crashing in digi operation.

One modification that it is a design error (and to my knowledge the only one) is in the software watch dog timer.

Back in May, when especially annoyed by the crashes, a search with the CRO found that the waveform on the A0 address line was really poor. The strong rounding which was observed was traced to the fact that the software watchdog timer U4 was loading this line with a 3k9 resistor and a 0.1 ufd cap. No wonder the waveform was bad and it certainly wouldn't have been doing the program much good if there was an occasional mis-read because of the distortion on that line.

Shortly afterwards I circulated on the packet network a mod which successfully overcame that problem.

It was —

Remove R27, it's a 3k9 located between U19 and U8, one end goes to the +ve 5 volt line and the other to the A0 address line.

U19 has a spare NAND date which can be accessed through pins 4, 5 and 6. This gate is wired as an inverter when one of its input pins is held high. use wire jumpers to join pin4 (U19) to one of the holes vacated by R27 and pin 5 (U19) to the other hole. It doesn't matter which.

At the edge of the board near C12 there is a short, 3-5 mm, trace on the underside. (It connects two small plated through holes and C12 solders to one of these) Cut this trace.

Use a jumper wire to connect pin 6 (U19) to the now isolated end of C12 The effect of this mod is to put a buffer inverting gate between the A0 line and the watch dog timer.

Since then I noticed that a VK2.. (sorry but I can't recall his name) suggested that it is better to run the watch dog timer off the interrupt line coming from the Z8530 It makes sense as it seems to be the Z8530 locking up anyway. In which case you would change the above mod by removing my suggested jumper from U19 to the A0 end of where R27 was located and take it from U19 to either pin 5 of the Z8530 or pin 16 of the Z80.

The VK2 suggested an increase in the delay for the watch dog timer. That shouldn't be necessary but if the watch dog timer doesn't start up properly it may be worth trying.

The last steps are also important and involve setting the parameters to minimise data problems on the outputs and inputs.

Set: Xflow OFF
Monitor OFF
Flow OFF
AX25 ON

Other default settings are fine although operators will want to fine tune many parameters to suit local needs. The above, however, are quite important to minimise lock up problems as they permit free flow of data.

Currently VK5RPM has run 10 weeks without a crash. It is starting to look hopeful that the problems are fixed.

Lastly, many operators have battled with the clock settings. VK5RPM is currently running with 238 as the CLKADJ and is keeping time closer than 1 sec per week.

The beacon on VK5RPM is set on B E 180 and operates on the dot, every 30 minutes on the hour and half hour.

Because CLKADJ varies from unit to unit depending on the crystal the following simple program will help you set the CLKADJ figure in your TNC220+.

The program was written in BASIC with simple variable names and little screen formatting to cater for as many computers as possible. When you have typed it in to your computer you may like to dress it up a bit.

Since writing the above article, John reports that the above modifications provided only temporary respite from the crashes. After some twelve weeks the problems recurred. This coincided with the arrival of summer activity. Clearly the article does not provide a complete solution but it may serve to encourage others to experiment and find the ultimate cure. **ar**

```
5 REM Written by John Drew (VK5DJ) on 30/7/89
10 CLS: GOTO 1000
97 REM
98 REM ******* this routine for the first time adjustment ******
99 REM
100 INPUT "Enter the gain in secs ";S1
110 S1 = S1 / D1
120 C2 = 7920 / S1
130 PRINT "The CLKADJ is ";INT(C2+.5);
140 RETURN
497 REM
498 REM ******* this routine is used for fine adjustment *******
499 REM
500 INPUT "How many secs lost or gained (minus sign for gain) ";S3
510 S2 = 7920 / C1 : S2 = S2 * (86400 + S3)/86400
520 S3 = S3 / D1
530 S4 = S2 + S3
540 C2 = 7920 / S4
550 PRINT "The new CLKADJ should be ";INT(C2+.5);
560 RETURN
997 REM
998 REM ******** Main loop **********
999 REM
1000 PRINT:PRINT "To calculate the CLKADJ for the TNC220+"; PRINT
1010 PRINT "For best results, you will need to have noted the time drift"
1020 PRINT "in the beacon over a period of a number of days."
1030 PRINT "e.g. If CLKADJ is 0 and a drift of 102 secs over 3 days ";
1035 PRINT "then CLKADJ = 233"
1040 PRINT
1050 INPUT "Enter the current CLKADJ in the TNC ";C1
1060 INPUT "Over how many days was the time change measured ";D1
1070 IF C1<1 THEN GOSUB 100 ELSE GOSUB 500
1075 IF C2<0 OR C2>65535 THEN PRINT " which is illegal, check figures"
1077 PRINT
1080 PRINT "Do you want more? (Y/N) ";
1090 A$=INKEY$: IF A$="" THEN 1090
1100 IF A$="Y" OR A$="y" THEN PRINT A$: GOTO 1040
1110 PRINT A$: PRINT"Good clocking"
1120 END
```

DO YOU SUFFER FROM TII?

DES GREENHAM VK3CO
16 CLYDESDALE CRT MOOROOPNA 3629

No, "TII" is not some new, exotic disease. It is, in fact, yet another form of radio interference! We have all heard and read about TVI (Television interference) and BCI (Broadcast interference). There have been many stories and articles on how to diagnose and correct these particular forms of interference that have plagued amateur operators for decades.

A new form of interference that has just appeared in recent times is TII. What is "TII", you may ask? This is "Turning Indicator Interference" — a recent problem experienced in modern cars.

Turning indicators have been installed in cars for around 30 years and have always consisted of some form of bi-metallic strip and relay to produce the required rate of flashing.

This type of unit is virtually immune to RF interference. To keep abreast with progress, vehicles now use a "chip" to produce the pulses which activate the vehicle turning lights. Of course, along with most chips they are susceptible to RF interference.

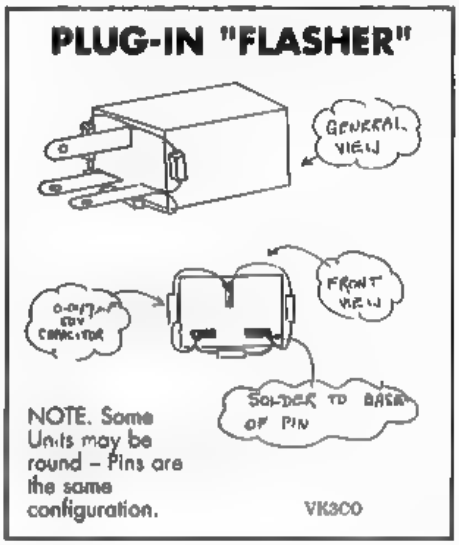
The effect is to render the turning indicator almost totally ineffective when transmitting in a mobile situation, particularly on the 2 metre band. The indicator, which normally "clicks" when operating, will produce a loud raucous noise and render the turning lights useless.

In some less affected vehicles the interruption rate is speeded up and the turning lights are also useless.

The author has experienced this phenomenon personally on three Holden "Commodores" and understands it does also occur on other makes and models. Thankfully, the solution is quite easy and does not involve any modification or work on the vehicle itself.

Step one is to locate the flashing unit, this can be done by switching on the vehicle ignition and operating the turning indicators — a steady "clicking" will be heard under the instrument panel. By removing a plastic panel, the "flasher" unit can be found and unplugged. The majority of vehicles use a three terminal unit which plugs into a socket hanging out of the main wiring loom. The solution is to simply solder 3 capacitors on the base of the pins of the unit and re-instal it. Quite an easy operation

The capacitor value is not critical, however, 0 047 µF, 50 volt minicaps are quite small and will fit around the unit easily — (see sketch) The bypassed unit is then re-installed. This procedure has cured the problem in all cases and you will find that you can turn corners and transmit simultaneously without problems. **ar**



1990 FEDERAL CONVENTION REPORTS

At an earlier Federal Convention it was agreed that the annual reports by the various Federal Co-ordinators should be published in the issue of Amateur Radio magazine immediately prior to each Convention

The statutory closing date for receipt of these reports this year is 23rd March. However, because of printing deadlines, the latest date for publication in this issue of Amateur Radio magazine was 5th March. Here are all the reports received by that date.

90.04.01 ANNUAL REPORT OF THE FEDERAL PRESIDENT FOR YEAR ENDING 31ST DECEMBER 1989

This past year has been a period of consolidation within the Federal sphere of the WIA. There have been some small changes as ideas and procedures put in place last year have been improved.

Executive Matters

Executive Office

Bill Roper, as Secretary and General Manager, has brought stability to the office after a number of years of change. Ross Burstall found he was unable to continue in the role of Assistant General Manager and Ann McCurdy has now taken on that role. Further details of the staffing of the Executive Office are provided in the General Manager's Report.

It should be noted that Bill Roper is still providing a considerable voluntary contribution to the work of the Executive Office, with the occasional assistance of the Melbourne based Executive. This practice is necessary to cover the shortfall in staffing which currently exists and involves considerable work on weekends and public holidays. The latest cutbacks in expenditure have exacerbated this situation further

Bill Roper has continued his review of office practices and procedures. The WIA is firmly committed to the philosophy that it is a "Service Organisation" and should appear that way to the members. Towards the end of 1989, a new computer system for the membership records was purchased. The faster response time of the new system has enabled the office to more efficiently answer the very popular question "Am I still a member?", as well as printing the address labels for AR in a much shorter time. This is not surprising when you compare the technology of the old Cromemco computer (using the CP/M operating system) with the newer, IBM compatible computer with a 286 processor and a 80M hard disk drive

Federal Executive

Following the appointment in 1988 of a number of interstate members to the Execu-

tive, a further step was taken in 1989 when, in addition to a number of Melbourne based members, a representative from each Division was nominated to the Executive. The members of the Executive elected at that time were George Brzostowski, VK1GB; Brenda Edmonds, VK3KT; Joe Gelston, VK7JG; Kathy Gluyas, VK3XBA; Ron Henderson, VK1RH (Vice Chairman); Peter Jeremy, VK2PJ, David Jerome, VK4YAN, Peter Mill, VK3ZPP; Kevin Olds, VK1OK, Neil Penfold, VK6NE, Bill Rice, VK3ABP and Bill Wardrop, VK5AWM. David Wardlaw, VK3ADW, was co-opted onto Executive as Immediate Past President. Kathy Gluyas resigned in July and the vacancy remained unfilled. Peter Mill recently tendered his resignation and has been replaced by Peter Maclellan, VK3BWD.

During the year the Executive met on 12 occasions, with three of these meetings being two-day Saturday and Sunday meetings. These two-day meetings have allowed many items to be considered in detail, particularly items relating to the financial, budget and performance aspects of the WIA.

This initiative has definitely been worthwhile, as a wider group of people are now more aware of what is involved in running the WIA on a daily basis. It has also furthered a better understanding between the Divisions and provided a good opportunity for the exchange of ideas. Although there have been some teething problems, this has been a successful arrangement and should be continued.

Corporate Planning

Following a detailed presentation to the 1989 Federal Convention, the Corporate Plan was adopted. Since then it has been reviewed on a regular basis and changes incorporated as issues were considered by the Executive. This document should not be thought of as something which is "set in concrete", but rather as a document which can be regularly updated to take into account the changing needs of the WIA. As expected, progress on some objectives is excellent, while work on other objectives still await the necessary resources.

Amateur Radio Magazine

Our magazine has undergone a program of steady improvement over the past year. This has included a new look front cover, new layout, WIANEWS and WIA information pages in each issue. Feedback from members on these changes has been very positive. Congratulations to all of those involved!

International Matters

The anticipated World Administrative Radio Conference (WARC) is to be held in Spain in 1992. Preparation for that Conference is already well under way. David Wardlaw and other members of the Executive are monitoring the flow of paper (which is well under way!) and are attending meetings with other interested delegates from the communication industry.

DoTC Matters

The greatest success in our dealings with DoTC over the past year must surely be the updating of the conditions of use of the six metre band. This has resulted in a much better operating arrangement for the majority of six metre enthusiasts. A great deal of the tribute for this goes to Peter Stackpole, VK1RX who, with the assistance and encouragement of a number of other six metre operators, prepared a very detailed paper for consideration by the DoTC.

One of the most contentious issues involving DoTC was that of Cross Linked Repeaters. The progress on this matter was well reported in the WIANEWS column of Amateur Radio and I do not propose to repeat it here, except to note that with the co-operation and good will of many members, Divisions and the Executive, a difficult problem is well on the way to being resolved in a way which is consistent with the "deregulated" approach which is the hallmark of current DoTC policy.

The Devolvement of Examinations issue proceeded at a modest pace following the appointment of Keith Carr-Glynn to the Radio Frequency Management Division. He has now completed his work and exams are now being handled by various groups around Australia. The WIA is concerned, however, that in some parts of this vast country, potential amateurs may find it difficult to locate and attend an examination. This matter will continue to be monitored.

The negotiations and debate on the issue of Third Party Traffic are still continuing! A submission has recently been made by the WIA pointing out the "deregulated" approaches currently being taken in a number of overseas countries. The Department is still considering this matter.

Divisional Visits

The difficulties in the airline industry have curtailed the usual travel itineraries of a number of members of Executive. In spite of this, I have been able to meet with members of the Divisional Councils of VK1, 2, and 4. I would like to thank the Divisional Councillors for their hospitality on these occasions. Other members of the Executive have also visited a number of Divisions. Field days and club activities have also featured on various travel itineraries. Members of the Executive appreciate these opportunities to make contact with the many and varied people who make up the hobby of amateur radio.

Thanks

There are many volunteer co-ordinators who contribute to the activities of the WIA on behalf of the Executive. On behalf of all members of the WIA, I would like to thank the following people for their efforts:

Graham Ratcliff	Amsat
Ken Gott	Awards Manager
Frank Beech	Contest Manager
Brenda Edmonds	Education
Hans Ruckert	EMC
John Edmonds	Historian
Bill Horner and Gordon Loveday	Intruder Watch
Ash Nallawalla	International Travel Host Exchange
Neil Penfold	QSL Manager (VK9, VK0)
Rob Milliken	Standards and FTAC
Bill Roper and Ron Fisher	Tapes (Federal News)
John Ingham	Tapes (Video)
Bill Wardrop	WICEN

Unfortunately, Ken Gott recently passed away.

I would also like to thank the members of the Executive, particularly Ron Henderson, and the Office Staff, especially Bill Roper, for their support and encouragement during what has been a very busy year for me.

PETER GAMBLE VK3YRP
FEDERAL PRESIDENT

90.04.02 REPORT OF IARU REGION 3 LIAISON OFFICER FOR YEAR ENDED 31ST DECEMBER 1989

Strong points

The year 1989 was one of consolidation following the triennial IARU Region 3 conference in Seoul in 1988. Arising from that conference the WIA representatives identified some 25 actions.

To date 18 of those have been completed, 4 are long term and ongoing whilst 1 requires initiation by another nation.

Consequently we are fairly well up to date with our international liaison.

During the year the WIA voted on a number of IARU matters concerned with election of officers and constitution updates.

As we reported last Convention, Michael Owen, VK3KI, is now IARU Vice President, the first non-American to hold this high office.

The WIA wrote to the Region 3 Association on two matters during the year, the Associations management structure and suggesting IARU set up a satellite fund. Both matters were referred to the Directors meeting for consideration.

A plaque was received from the IARU

Monitoring System International Coordinator, Bob Knowles, ZL1BAD and presented to Bill Martin, VK2COP by the President to acknowledge his IW efforts

Last Convention the Council, in planning the budget, identified International Representation as a separate component and set it at $2 per member per year. I commend them for this action as we now have a firm planning basis for our international relations funding. This fund will finance all WARC and IARU activities, such as the Australian Preparatory Group (APG) meetings in the country between now and WARC92, amateur representation on the official Australian Delegation to WARC92 in Spain, and the Australian delegation to IARU Region 3 conferences, the next being in Indonesia in 1991. Incidentally our WIA representation in Indonesia should be a minimum of three in order to cover all working party activities and allow new people to gain exposure in the international arena.

With the next Region 3 conference in 1991, we should be starting now, in 1990, to identify issues which need to be on the agenda for that conference. We can take it for granted bandplans will be discussed as will WARC92 attitudes and aspirations of the amateur community.

Problems

Two matters from the Seoul conference, which have not progressed as fast as we would have liked are, obtaining from DoTC agreement that amateur to amateur through amateur communications are not third party traffic, and the use of the national prefix VKx/ before home calls for visiting amateurs as is done in much of the remainder of the world. Both issues continue to be pressed with DoTC

Ron Henderson VK1RH
WIA IARU Liaison Officer

90.04.03 FEDERAL FINANCIAL REPORT FOR THE YEAR ENDED 31ST DECEMBER 1989

The full financial statements of the Federal Body of the WIA for 1989, audited by Harmon Partners, will be submitted to the 1990 Federal Convention.

Complete publication of those statements in Amateur Radio would not only take up a lot of space, but would also be boring to most members.

Therefore, the following is a precis of the Financial Report being submitted to the 1990 Federal Convention, together with a chart of the Income and Expenditure, both budgeted and actual, for 1989, and the budget for 1990. If you would like to see a copy of the complete financial statements, then contact your Divisional Federal Councillor who will only be too pleased to arrange for you to see a copy. If this is not practicable, then copies may be available by contacting the Executive Office.

For the second year in succession I have been acting in the dual role of WIA accountant/book-keeper and Treasurer. I do not believe this is a situation that should be allowed to continue, and I am concerned that the WIA seems unable to find a competent volunteer to take on the important position of Treasurer!

The final budget for 1989 is shown in the left hand column of figures in the chart of Income and Expenditure, and the actual figures are shown in the centre column.

A non-profit organisation such as the WIA should **NEVER** budget for a loss! A non-profit body can only make capital expenditure for fixed assets, such as equipment and furniture, from Accumulated Profits!

However, because of the urgent requirement to continue upgrading the efficiency of operations of the Federal Body of the WIA during 1989, and realising that, because of the cumbersome hierarchical structure of the WIA, increased membership fees to cover the costs could not be put in place before 1990, the Federal Body accepted a 1989 projected loss of $34,500.

Based on this budget, the Federal Body incurred a net loss on operations for the year of $36,460, which was $1,950 more than expected.

Some of the more significant aspects of the audited 1989 financial statements include the following:-

AR Advertising, a major source of income, was $3,250 under budget after allowing for the $9,337 book entry relating to the contra advertising arrangements with three commercial electronics magazines. Again in 1989 the Executive Office received no help from any of the Divisions in obtaining advertising for Amateur Radio magazine!

The 1990 Australian Radio Amateur **Call Book** produced a profit of just $5,000 after deducting the commission payable to the Australian Government Publishing Service for the "privilege" of publishing the Call Book, and the Executive Office overheads. The quality of the amateur radio station callsign information supplied from DoTC again resulted in many hours of unnecessary work by the WIA.

Income from **Members Subscriptions** was well down on budget because, instead of the forecast increase in membership, the membership actually decreased to 7619 as at 31st December 1989.

Convention Expenses were $9,090 over projections because of the two unbudgeted Extra-ordinary Federal Conventions held during June and November. In future, the costs of the additional three Conventions each year should be offset by the reduced cost of the Annual Federal Convention.

Executive Travel was $1,210 under budget only because the Federal President and Vice President were able to visit Divisions as part of their employment travels around Australia.

Salaries & Secretarial costs were kept down to $14,545 under budget for the year, by decreasing the number of staff, and reducing the working hours of several others.

Amateur Radio magazine, the publishing of which involves at least half of the workload of the Executive Office, cost $550 less than budgeted. This is a pleasing result considering the substantial improvements made in presentation of the magazine during 1989.

1990 Budget

The budget for 1990, which is shown in the right hand column of the chart of Income and Expenditure, was arrived at after much deliberation. In approving the budget at the full meeting of Executive on 10th and 11th February 1990, the following motion was passed:

900201

It was **RESOLVED** that this Executive,

A. noting the terms of the Budget as proposed by the General Manager and Secretary;
B. noting it is based upon the best available projections for membership of the WIA,
C. noting that it is prepared on an assumption that membership will be increased by 380 new members;
D. recognising a need to increase the budgeted surplus from $10,000 to a figure approaching 5% of income, that is of the order of $20,000;

RESOLVES to accept the budget for 1990 as promulgated by the General Manager and Secretary with the following provisos:

1. that the Divisions accept a recruiting target of an additional 430 new members in addition to the assumed 380, thus setting the recruiting target to 825 new members;
2. that the Executive may take whatever steps may be necessary to achieve the budget surplus, including -
   (a) the adjustment of the number of pages of AR,
   (b) review of the number of Extraordinary Conventions to less than four per year;
   (c) an adjustment in salary liabilities by adjusting working hours of staff;
   (d) devolvement or shedding of functions.

If any member has any questions about the finances of the Federal Body of the WIA, they should be addressed in the first instance to the Federal Councillor of their local Division.

Bill Roper VK3ARZ
General Manager & Secretary

CHART OF INCOME AND EXPENDITURE

INCOME	BUDGET 1989	ACTUAL 1989	BUDGET 1990
ADVERTISING (incl HAMADS) - AR	51000	47750	37600
CALL BOOK	26000	32621	28000
DONATIONS	350	142	150
INSERTS - AR	600	646	600
INTEREST RECEIVED	18000	17436	11500
MAGPUBS	0	10782	7500
MEMBERS SUBSCRIPTIONS	257000	239306	310500
SUBSCRIPTIONS (O/SEAS DIRECT) - AR	5000	4339	4000
SUNDRY INCOME	50	1529	750
TEAC FEE INCOME	3875	6485	4650
TOTAL - INCOME	**361875**	**365374**	**405250**
LESS EXPENDITURE			
AMSAT	1500	463	1500
AUDIT FEE	2000	1900	2000
AWARDS - AR	700	315	500
AWARDS & SPECIAL PROJECTS	1200	1558	750
BAD DEBTS WRITTEN OFF	250	69	500
BANK CHARGES	1250	1273	1300
BULK POSTS - AR	33000	37270	36700
CALL BOOK EXPENSES	12000	13619	14750
COMMITTEE/COORDINATOR EXPENSES	750	919	1000
CONVENTION EXPENSES	14000	23090	19000
DEPRECIATION	10000	10102	6800
DRAFTING - AR	1500	662	1000
ELECTRICITY	1500	1398	1500
GENERAL EXPENSES/SUNDRIES - AR	250	0	0
GENERAL EXPENSES/SUNDRIES	1500	1784	1500
I.A.R.U. DUES	4400	4347	5175
INSURANCE/WORKCARE LEVY	3000	3135	3100
INTERNATIONAL REPRESENTATION PROVISION	0	0	11120
LONG SERVICE LEAVE PROVISION	3250	764	620
MAGPUBS EXPENSES	0	7666	4800
POSTAGES & FREIGHT	7500	9046	9500
PRINTING - AR	72000	74561	78850
PRINTING/STATIONERY/OFFICE SUPPLIES	6000	5567	9000
PRODUCTION EXPENSES - AR	1700	1338	0
PROMOTION/ADVERTISING/RECRUITING	11000	9972	4500
RENT & CLEANING	7000	7575	8300
REPAIRS & MAINTENANCE (OFFICE)	3500	3910	2000
SALARIES & SECRETARIAL	148000	133455	125000
TEAC EXPENSES	2000	3030	2400
TELEMEMO - KEYLINK	2120	2118	0
TELEPHONE	2500	2480	2600
TRAVEL - AR	1000	972	0
TRAVEL (EXECUTIVE)	2500	1290	2000
TRAVEL (OFFICE)	1000	1112	750
TYPESETTING - AR	25000	24849	26110
WRAPPING & ADDRESSING - AR	11500	10219	10500
TOTAL - EXPENSES	**396370**	**401826**	**395125**
SURPLUS/DEFICIT	**-34495**	**-36452**	**10125**
NETT AMATEUR RADIO COST	**196395**	**195845**	**198945**

90.04.04 ANNUAL REPORT OF THE PUBLICATIONS COMMITTEE FOR THE YEAR ENDED 31ST DECEMBER 1989

Each year this Committee's report has referred to its affairs over the year as having been anything but dull and uneventful Yet compared with 1989 previous years were relatively dull!

To begin with, as foreshadowed last year, Betken Productions had given notice in November 1988 that they could not continue with AR beyond the January 1989 issue This meant that new producers, typesetters and printers had to be found very rapidly, a process made more difficult by the Christmas holidays during which most similar organisations close their doors for two or three weeks.

To cut a long story short, a new firm of typesetters was found very rapidly, located only a few minutes drive from the Executive office It is only fair to give all the credit for these negotiations to the General Manager, Bill Roper, who not only made initial contact with Redfords, but also gave them a good idea of our requirements and arranged a provisional contract.

Central to their activities is a Macintosh computer, not only for typesetting but also for the so-called "paste-up" phase, ie the actual physical arrangement of the material on each page It rapidly became apparent that although this process was a good deal faster than the earlier methods it placed more load on the Editor and his helpers. Total responsibility for material selection and rough placement now became vested in the Editor, who in effect now became the producer as well This added responsibility extended to proof-reading and corrections after typesetting The first issue under the new arrangements (Feb 1989) also included some 27 pages of technical data, mostly in tabular form, which it had been decided not to publish in the Callbook. The result of this was ten full days of voluntary and unpaid work by the Editor, who as a member of Executive could not accept paid employment by the WIA. Obviously such a situation could not continue

Fortunately the solution to the problem lay within it. Now that production had become an "in-house" job it was no longer costing us money In fact we were saving nearly $1000 a month compared to 1988 costs. Obviously this was sufficient to attract a part-time Managing Editor who would become largely responsible for production Such people do not "grow on trees" and we were very fortunate, resulting from an appeal in the March editorial, to obtain the services of Graham Thornton, VK3IY, as Managing Editor Others did in fact apply (one from Sydney and one from Hobart) but having so recently regained

direct "hands-on" control of production we were reluctant to experiment with detail management by remote control. I think the results since Graham's appointment speak for themselves.

I have mentioned proof-reading. I think the statistics are worth making known. On the third Thursday of every month the two Editors plus at least two other people put in a whole day on proof-reading. The number of errors discovered usually lies between 500 and 1000! At the second reading, only a day or two later, this has usually been reduced to about 50. At the third and final reading these have all (hopefully!) been removed. Some nearly always elude us, but we try every month to achieve that elusive target of zero errors.

As mentioned last year, we were looking forward to the first DX column by Pat Kelly, VK2RZ. This appeared in April, and Pat continued to provide a well-written "How's DX?" page or two until the September issue, when he had to relinquish the task for health reasons. Fortunately at about this time Stephen Pall, VK2PS, who had been a prolific source of DX information to successive columnists for many years, was able to take over the actual writing of the column. All of us, particularly the DX enthusiasts, are greatly indebted to Stephen for the many hours each month it must take him to collect and collate all the information.

We have had problems for several years in the reliable reproduction in black and white of photographs supplied as colour prints. Pictures which looked good in colour often turned out, after half-tone dot screening, either lacking contrast or, more frequently, far too dark. One of Graham Thornton's major contributions, soon after he joined us, was to establish why this trouble occurred. Until then enquiries always seemed to conclude in a "vicious circle" in which the photographer, plate-maker and printer each blamed the other two for some alleged shortcoming, but no-one could offer an effective solution. The problem turned out to be one of colour balance. The dot-screening process uses blue light, so areas which do not reflect blue are reproduced as black. Graham devised a simple way of checking in advance how a print would reproduce, so that those which were unsuitable could be discarded in advance. He also located a specialist photographer able to re-process prints to change their colour balance favourably if the subject was vital to the article. The results have been excellent, as will be seen by comparing recent issues of AR with those early in 1989. Many thanks, Graham!

Advertising still remains a problem area, and frequently a whole issue contains advertisements only from Victoria and New South Wales. I repeat what seems an annual appeal for the other Divisions to try persuading local dealers or sales people that there is a market accessible through advertising in AR.

Perhaps the market is not confined to amateur radio equipment. Now that the detailed results of last year's survey of members have been issued, perhaps we may hope wider markets may be indicated in that data. One development this year has been the introduction of corporate style advertising on the front cover of the October and November issues, but the market here is very limited, and frequently the cover is needed in support of an article or a topical theme. Still it is pleasing to have an occasional cover which pays rather than costing money.

As regards money, it is a pleasure to report that the advance and un-audited figures for 1989 show that the magazine costs were almost exactly on the Budget target. There was a surplus of a few hundred dollars in fact, in a total approaching $200,000.

For this excellent result, the General Manager deserves enthusiastic congratulations, since it has been achieved only by his unremitting attention to every detail of AR finances.

Other items deserving mention are the Callbook (edited by Bruce Kendall) which returned a useful profit, the 20 year index in either disk or hard copy format (many hours of keyboard work by Ron Fisher) which is selling well, the further-improved layout style from October (again largely under Bill Roper's guidance) and the appointment of John Friend, VK3ZAB, as our official photographer. Many thanks to all concerned for a job well done!.

BILL RICE VK3ABP
EXECUTIVE EDITOR

90.04.05 REPORT OF FEDERAL TECHNICAL ADVISORY COMMITTEE FOR YEAR ENDING 31ST DECEMBER 1989

Strong points

On the digital front FTAC has been involved in advising on packet network negotiations with DoTC

Repeater activity has been concerned with site EMC/EMI at three sites, leading to the need to reverse the repeater input and output frequencies in the 147 - 148 MHz segment to achieve compatibility. Advice was given on repeater linking negotiations with DoTC.

Beacon activities have been related to the change of the 28 MHz beacon service to time sharing in accordance with the revised IARU band plan, a review of the need for beacons in the 50.05 - 50.2 MHz segment (two specific frequencies were recommended, and both were allocated for use - as demand increases time sharing is to be adopted). It is noted with regret some beacons are still not to band plan despite the lapse of several years.

Bandplans have been reviewed and the results of the last Federal Convention are being published now the 1296 MHz plan has been cleared with the CAA. Negotiations with DoTC concerning exclusive Australian UHF and microwave segments has been suspended pending the first meeting of the APG for WARC92. Some 1296 MHz repeaters are not to band plan.

Several VHF/UHF record claims were evaluated during the year and the current list published in Feb 90 AR. The listing is over-complicated by including all state records for all bands and several modes. It is recommended that in the future only national records be kept, and for a lesser number of modes/circumstances. Attached is the latest status in the recommended format

During the year comment was provided on two significant DoTC papers relating to EMC/EMI. One was concerned with the introduction of a RF Tag Identification system and the second was a position paper on Electromagnetic Compatibility.

In summary, useful progress has been made on a number of issues dragging over from past years.

The WIA has continued to be active in Standards Australia affairs. Progress is evidenced by the recent postal vote (the WIA voted in the affirmative) on a draft standard by Committee TE/14/4 Siting of Radiocommunication Facilities, Part 3, Satellite Earth Stations. Part 4, Broadcasting & Mobile Services (VHF & UHF), is still being considered.

Weak Points

Once again there has been a pronounced lack of input from Divisions and the amateur body generally, with one obvious exception. Advice provided by FTAC on means of repeater linking came in for considerable and vocal criticism. Approximately 3 months after that advice was given a number of well reasoned papers were received and the situation retrieved.

It is a pity it took so long to obtain those views and well illustrates the difficulty in communicating with the practising amateur out there in the Divisions. FTAC must use AR magazine and Federal tapes more to overcome these communications barriers. But how do we inform the non-member?

Unfortunately the pressure of work precluded my giving anywhere near the attention to FTAC that it deserved and it was with real regret that I had to tender my resignation

as Chairman of FTAC to the January 1990 Executive meeting. Whilst I cannot be an active member in the coming year, I am more than willing to assist where required on any repeater EMC/EMI issues which may arise.

Recommendations

Following WIA tradition, and in compliance with Federal Council resolution 85.09.13, it is RECOMMENDED all microwave band plans from 1296 MHz upwards be reviewed to ensure they reflect Australian amateur practice. The review results should be PUBLISHED in AR magazine and presented to Council for consideration in October/November 1990.

It is RECOMMENDED the Australian VHF/UHF records be simplified to show only those categories shown in the statement attached.

R. Milliner VK1RHM
RETIRING CHAIRMAN FTAC

AUSTRALIAN VHF, UHF and SHF RECORDS

CORRECT AS AT 3RD MARCH 1990.

LEGEND
* - Australian record
# - New record since last publication in Feb 90 AR.

1. HOME/PORTABLE CATEGORY.

52 MHz	VK8GB	to	9Y4LL	10/04/82	18,665.4 km.
144 MHz	VK4ZSH/4	to	JA7OXL	24/04/83	6,616.9 km.
432 MHz	VK3ZBJ	to	VK6KZ/6	23/01/80	2,715.9 km.
576 MHz	VK3KAJ/5	to	VK3ZBJ	25/ 2/89	382 9 km.
1,296 MHz	VK3ZBJ	to	VK6WG	18/03/88	2,449.3 km.
2,300 MHz	VK5QR	to	VK6WG	17/02/78	1,885.5 km
3,300 MHz	VK5QR	to	VK6WG	25/01/86	1,885.5 km.
5,650 Mhz	VK5NT	to	VK5ZO/P	12/11/89	176.4 km
10,000 MHz	VK3KAJ/3	to	VK3ZBJ/3	8/02/86	252.1 km.

2. EME CATEGORY.

144 MHz	VK3ATN	to	K2MWA/2	28/11/66	16,761 km.
432 MHz	VK6ZT	to	K2UYH	29/01/83	18,726.4 km.
1,296 MHz	VK3AKC	to	W2NFA	6/10/73	16,713 km.

3. ATV CATEGORY.

432 MHz	VK7EM/T	to	VK3ZPA/T	13/12/72	413 km.

4. MOBILE CATEGORY.

144 MHz	VK3KAJ/M	to	VK6BE	25/ 1/86	2,224.5 km.
432 MHz	VK3KAJ/M	to	VK6BE	25/ 1/86	2,224.5 km.
576 MHz	VK3KAJ/M	to	VK3ZBJ	26/ 2/89	122.5 km
1296 MHz	VK3ZJC/M	to	VK3KKW/M	16/ 9/89	137.6 km.

5. DIGITAL MODES CATEGORY.

52 MHz	VK3ZJC	to	VK8ZLX	26/12/88	1,906.3 km.

RAY ROCHE VK1ZJR
FOR FTAC

90.04.08 REPORT OF FEDERAL INTRUDER WATCH CO-ORDINATOR FOR YEAR ENDED 31ST DECEMBER 1989.

1989 was a disturbed year. Two changes of Federal Co-ordinator have not made this report easy to compile. Maybe 1990 will be more satisfactory?

VK4 still has the most observers and hence most reports. Unfortunately amateurs in most other states seem to believe the situation is not serious. Whatever happened to all the other observers in those states? Did they run out of patience or lack of interest in their fellow amateur? Do not start blaming the WIA when the band cuts occur, or the "heavies" close the bands to you.

Relations with DoTC are cordial, with several new ideas being tried to improve our presentation to their Monitoring Service, so that action can take place at Government level.

A few statistics:

VK1	NIL	observers		
VK2	4	"	32	logs
VK3	4	"	27	"
VK4	16	"	342	"
VK5	3	"	27	"
VK6	7	"	44	"
VK7	1	"	(SWL)3	"
VK8	3	"	25	"
	38			498

[illegible]	
B/cast mode	566
A1A/F1B	2854
RTTY	534
Other	1617
CB intrusions from our near North	19372
	23943

What other reason need I stress for the majority of amateurs to throw their weight and reports behind the 38 observers who are doing a fine job and getting NO immediate reward for their efforts?

Merit Certificate Still being checked.

Was Intruder Watching part of your New Year resolution?

GORDON LOVEDAY VK4KAL
FEDERAL INTRUDER WATCH
CO-ORDINATOR

90.04.09 REPORT OF THE FEDERAL CONTEST MANAGER FOR THE YEAR ENDED 31ST DECEMBER 1989

The 1989 John Moyle Memorial and Remembrance Day Contests both enjoyed wide support with a healthy mix of HF and VHF entries received. Unfortunately, the same cannot be said of the Ross Hull and Novice Contests which continue to receive little support.

Perusal of the VHF/UHF entries in the Remembrance Day Contest will reveal the almost complete lack of entries in certain states, i.e. from VK2, only 3 entries, and from VK3 only 8, whilst the VK6 area produced 48, this from a total Remembrance Day Contest that produced 136 VHF logs.

Of the 22 entries received for the latest Ross Hull Memorial Contest, 15 came from Victoria and no entries came from New South Wales. This lack of VHF/UHF activity during the contests period has been evident for a number of years and in my opinion should be reason enough to cease holding VHF/UHF Contests in this country.

The Contest Manager held a second trial VHF/UHF contest this summer to test the need for and acceptance of the concept of a VHF/UHF one day field day Contest similar to those enjoyed by amateurs overseas. The results are again most disappointing with only 10 entries being received

Contest Reports

Ross Hull Memorial Contest

Support for this Contest remains almost static with the 1989/90 Contest attracting only 3 more entries than in 1988/9. The addition and attraction of bonus points for contacts up into the UHF regions provided little attraction and participation remains very poor. Band conditions were erratic during the contest period and this could have had some bearing on the numbers participating.

John Moyle Memorial Contest

Run in conjunction with the New Zealand Field Day Contest, this Contest remains quite popular. The repeat contact rule remained a problem with large areas of the country having quite limited band openings across the Tasman. As this contest is open to all call areas, and is primarily a HF Contest, this year I returned to the widely accepted contest rule of "One contact per mode per band" for all stations. This should solve the problems that arose from allowing repeat contacts after a few hours.

Novice Contest

This Contest seems to be in decline with Novice stations sending in fewer and fewer logs each year. This year, the leading Novice stations in each state received contest certificates and I hope that this will encourage more activity in future Novice Contests.

Remembrance Day Contest

Remains our most popular contest, with a good mix of entries in all sections. The 1989 Contest attracted 427 entries overall, 136 of these being in the VHF section. Looking back over the years, participation remains very good and most agree on it being "the friendly contest" and long may it remain so.

Contest Publicity

Advance publicity for our contests is a problem in Australia and, whereas advance publicity is provided freely through our associated societies and magazines in other countries, the same cannot be said about a commercial amateur radio magazine which is printed in Australia. I have forwarded copies of all our contests to this particular magazine and have as yet to see anything in print. As a number of the active amateurs who are not WIA members read this magazine, I believe that the use of "paid for" column space should be investigated

In conclusion, I wish to thank all those amateurs who have sent logs to me for adjudication. Standards of log keeping have remained very good, although some mistakes have occurred whilst I have tried to read signatures and callsigns written in longhand. A small number of entrants have been disqualified for omitting or refusing to provide information required in the rules.

Frank Beech VK7BC
Federal Contest Manager

90.04.12 ANNUAL REPORT OF THE FEDERAL QSL MANAGER FOR YEAR ENDING 31ST DECEMBER, 1989

Operation of the bureau continued through 1989, with more QSL cards being sent to ANARE in Tasmania. This is because the bureau has no forwarding address or home callsign of the operators who are stationed in the Antarctic. ANARE have not told the bureau what is done with the cards after they receive them. No replies to any correspondence included with the cards have ever been received fom ANARE.

The geographical mess of the VK9 and VK0 prefixes is now being felt by the sorting officers of the bureaux. Direct mail has been received for callsigns: VK9TAX, 9TR, 9TC, 9DX, 9AMY, 9DH, etc. and of course the VK9Y 's stationed on Macquarie with a Limited licence.

In consultation with the VK2 Bureau Manager a real problem exists to which no practical solution could be found that would find favour with all amateurs. The VK2 Bureau holds cards for many operators who have been and are presently operating from the off-shore islands. These members and non-members do not want cards via the bureau, having made no attempt to has them forwarded on to themselves. VK2, after holding them for some considerable time, has no option but to destroy the cards. It is far too costly to return them to the sender.

Having only two operators advise the Federal Bureau of where to send their cards, the rest are usually now despatched to ANARE and VK2. Once the home callsign of a VK9/VK0 operator is "discovered", a suitable size packet of cards is made up and sent to the home callsign address (e.g. VK9TAX = ZL2TAX) at the WIA's expense. Is this fair?

Norfolk Island (post code 2899) costs $8.10 per packet (parcel) up to 2kg. Hardly a month passes without an accumulation of 2kg of cards. For VK9YH/F6GVD, VK9YD/OH5VD for example, it costs the WIA $3 for a 500gram packet. VK9YG has accumulated another 1kg of cards in the Federal bureau which will cost $8.60 to forward on to G land.

Another factor is that the bureaux managers don't send cards to the operators who themselves have a manager. For example, VK9YV has (had) G3AAG, as a manager (actually his home call) and many cards are marked "Via G3AAG". But the bureaux still send them to the Federal Bureau of the WIA. It's easier.

In these days of rising postal charges there appears to be one solution before destroying the incoming cards. Where the home callsign or address of the VK9/0 operator is known, a letter of enquiry be sent requesting an answer as to what to do with that operator s cards. No answer in reply or a "destroy" answer be carried out. Also a "donation to assist with onforwarding costs" could be asked for explaining the reasons why it was asked for.

Recommendations:

1. Unless advised beforehand, a letter be sent to the VK9/VK0 operator requesting a direction be given as to disposal of QSL cards:
   (a) Onforward, or
   (b) Destroy.
2. If onforward request received, a postal cost be levied sufficient to cover the cost of mailing. Postal charges to be given in original letter
3. Overseas Magazines and Bureaux be advised that the operator has chosen (1(b).

Neil Penfold VK6NE
Federal QSL Bureau Manager

90.04.13 REPORT OF FEDERAL EDUCATION CO-ORDINATOR FOR THE YEAR ENDING 31ST DECEMBER, 1989

The year 1989 will be remembered as the year in which examination devolvement finally became a reality

After over two years of discussion and consultation with the WIA and a number of other bodies, DoTC appointed an Examinations Officer to oversee the devolvement process.

Keith Carr-Glynn did an excellent job, moving swiftly and efficiently, and keeping us informed of progress throughout.

Consequently this has been a very busy year in the Education field. Liaison with

DoTC has been close and continuous and, I believe, mutually beneficial.

We were very pleased that DoTC acceded to our request for access to the examination Question Banks before their distribution. I received the draft copies in May, whereupon I convened a meeting of education representatives from the Divisions for mid-June to review the questions. Unfortunately only VKs 3, 4 and 7 were able to attend the weekend meeting, but some input was received from the other Divisions in response to my circulation of a number of the questions to them. It was not possible to review the whole of the two banks in the time available, but full comments were eventually sent to DoTC. Most of our requests for amendments to the Novice bank were granted, but a significant number of which we did not approve were allowed to remain in the AOCP bank.

The second half of the year saw the release, in stages, of the revised banks, both in printed version and on computer disk, the Regulations bank, the CW program on disk, the procedures volume and the exam generation program. The Examinations Officer then stated that he was ready to receive question papers for accreditation.

It is pleasing to note that when the Examinations Officer relinquished his position at the end of January 1990, there were 70 names on the examinations mailing list, and over 200 papers had been accredited. It is also pleasing that a degree of co-operation is developing between the Divisions with regard to examinations. Some feed back is reaching me about the Divisional planning for examinations and the preparation of papers. I have also received a number of comments about the banks and the generating program.

I have prepared two papers from each bank which will be made available as sample papers, and expect to have a stock of accredited papers available shortly. I am not entirely happy with the generating program, but I believe that the main problem lies in the uneven distribution of questions in the banks. There is an urgent need for more questions to be added in some sections.

The low points in the year are the old ones of lack of information input from members. I have asked for listings of clubs in each Division, but so far only VK4 has responded.

I have also had little response to my requests for information on classes, on-air CW training sessions or schools with active amateur stations. There is a great need for a central register of this type of information.

In summary, most of the year has been taken up with activities related to devolvement. I have had the usual range of requests for information, sample examination papers or CW tapes. I have attended Executive meetings, Joint DoTC/WIA meetings, some club meetings and several club or zone conventions.

Future activities which I see as important are:

a. continued liaison with DoTC about examinations;
b. establishment of links with all other examining bodies;
c. setting up a register of times and venues of examinations;
d. collection of examination statistics and information;
e. preparation or collection of new questions to be added to the banks;
f. preparation for evaluation of the devolved system after about two years.

Recommendations

Now that devolvement has taken place, it is time to review some of our earlier ideas. Since we have a great number of examiners, there does not seem to be any need for the employment of a Federal Examinations Co-ordinator, as was recommended in 1987. This recommendation should be rescinded.

A similar recommendation that provision of examination materials be on a cost recovery basis should be reaffirmed.

It is also recommended that all examination materials produced by WIA agencies carry appropriate identification to ensure that candidates are introduced to the WIA at the earliest opportunity. The change in the examination system gives us the best opportunity for years to recruit new members.

I would like to thank all those who have helped me this year, whether by providing information, criticising questions or discussing ideas. They have made my work easier and more enjoyable, thus making it more valuable to members and the WIA.

Brenda Edmonds VK3KT
Federal Education Co-Ordinator

90.04.14. REPORT OF FEDERAL HISTORIAN FOR YEAR ENDING 31ST DECEMBER 1989

Most of the material held by the WIA is now stored by the Federal Historian. The radio journals are accessible for research, but need further cataloguing. However any additions can be readily coped with and would be gratefully accepted, particularly journals issued before 1940 except perhaps QST. It has been difficult to respond to some specific detailed requests simply because of the difficulty in locating a specific item in a large amount of uncatalogued material.

It has not been possible to accept offers of historic hardware because of the difficulty of collection and storage, but I have suggested that offers should be made to Divisions or to amateur collectors. Should the WIA have a new policy on the possibility of a museum or do we depend on the enthusiasm of Divisions and individuals?

It is essential that we continue to sort and catalogue the present documentary material. Much of the valuable work done by previous historians has not been fully used because of the lack of continuity resulting from the inevitably intermittent cataloguing. The present system would not meet the standards of a professional archive, but it will allow easy and not-too-slow access to the material as required.

J W Edmonds VK3AFU/ATG
Federal Historian

90.04.15 REPORT OF AMSAT-AUSTRALIA COORDINATOR FOR YEAR ENDING 31ST DECEMBER 1989

1989 has been yet another busy year as many more Amateurs look towards the Amateur Satellite Service with an eye to using one or more of the 7 new satellites due for launch in the first 2 months of 1990.

The first 6 will be launched aboard an European Space Agencies Ariane 4 launcher. Two satellites (UoSAT-D and UoSAT-E) were built by the University of Surrey group and are similar to the previous UoSATs namely scientific and educational satellites with the exception of UoSAT-D which has a general-access Amateur Packet Radio store-and-forward package similar to FUJI-OSCAR-12 but using 9600 baud AFSK. The other 4 satellites are known as MICROSATS (because of their size - 9" cubes). Two of the Microsats i.e. PACSAT (AMSAT-NA) and LUSAT (AMSAT-Argentina) will have general-access Amateur Packet Radio store-and-forward packages, another Microsat known as WEBERSAT (Weber State College in Utah) will carry a video camera imaging system and the fourth DOVE will be an educational satellite with a Digital Voice synthesizer speaking messages and satellite telemetry in a number of different languages. The 7th satellite due to be launched in February 1990 by the Japanese Space Agency NASDA will be an 'enhanced' replacement for FUJI-OSCAR-12 which was decommissioned in late 1989 due to insufficient power budget. This new Japanese Amateur Satellite will be put into a much more favourable orbit and therefore should be able to support much more store-and-forward packet radio bulletin board service (PRBBS) and it also has a Mode J voice transponder.

Other events that occurred during 1989 that have seen an upsurge of interest in the

Amateur Satellite Service have been the Amateur Radio operations conducted by the Russian Cosmonauts on the Soviet Space Station MIR on 145.550 MHz FM simplex with hundreds of contacts being made by Australian Amateurs with modest 2 metre equipment. The lead up to the decay of UoSAT-OSCAR-9 on the 13th of October 1989 also generated a significant amount of interest as many Amateurs and school children monitored the 2 metre beacon telemetry of a dying spacecraft that had given 'virtually' continuous service since its launch on 6th October 1981. AMSAT-OSCAR 13, the Amateur Satellite which allows world-wide communications on 145, 435, 1269 and 2304 MHz bands completed its first year of service on the 15th June 1989. The use of the Mode S transponder began in April 1989 which meant that many more Amateur signals are now appearing on the 2304 MHz band. On a slightly low note the computer software on OSCAR-13 failed 3 times during the last 3 months of 1989 due to extreme high energy particle bombardment caused by the high solar activity but Ground Command Stations in Germany and Australia reloaded the software and had the satellite functioning again within (on at least 2 occasions) 24 hours.

To give the Federal Councillors some appreciation of the interest in the Amateur Satellite Service during 1989 AMSAT-Australia received just over 1200 items (compared to 1000 in 1988) of correspondence requesting information on hardware, literature and of course tracking and telemetry decoding software from Amateurs and non-Amateurs. AMSAT-Australia also produces an 8 page monthly NEWSLETTER which has now had over 500 subscribers since it started production in April of 1985. Also since April 1987 I have 'manually' uploaded and downloaded Packet Radio messages from the Digital Communications Experiment (DCE) on UoSAT-OSCAR-11 to and from Australian Amateurs to Amateurs throughout the world. The majority of messages have been between Amateurs in Australia and the UK on the basis that as GB2UP is a special event station the DCE traffic does not constitute 'third party traffic'. I am still awaiting feedback from the WIA and DoTC negotiations on this subject since November 1988.

Finally, I would like to thank the WIA for its continued support of the Amateur Satellite Service via the activities of AMSAT-Australia and ask the 1990 Federal Convention to recommend that the WIA strongly support the formation of an IARU Satellite Fund by whatever means are at its disposal and that the financial support for AMSAT-Australia be continued at the present level.

GRAHAM RATCLIF, VK5AGR
AMSAT-AUSTRALIA NATIONAL COORDINATOR

90.04.17 REPORT OF FEDERAL TAPE CO-ORDINATORS FOR YEAR ENDED 31ST DECEMBER 1989

During 1989 both Ron and I worked hard to meet the aim of the Federal Tapes in providing high quality news and comments from the Executive Office of the WIA for dissemination on weekly Divisional News broadcasts.

The tapes were recorded fortnightly in the Executive Office with two news segments on each tape.

Preparation of the news material for a two news segment tape averages five man-hours; the recording a total of another man-hour; and duplication of the tapes and despatch another two man-hours.

Again this year, several constructive comments were received from Divisions which helped us to even further improve the presentation of the news.

Unfortunately, on several occasions during the year, the Federal Tape segment was not included in a particular Divisional broadcast without explanation to the listeners.

Spot checking of the Divisional news broadcasts by both Ron and me again showed a marked difference in quality of replay of the Federal Tape from Division to Division. Apparently this is a result of the different equipment used for replay in the various Divisions, as the tapes are checked for consistent quality before being despatched from the Executive Office.

Both Ron and I would like to thank those volunteer Divisional broadcast announcers and engineers who helped us so ably in presenting news from the Executive Office of the WIA to the amateurs of Australia. The comprehensiveness of the Divisional news broadcasts gives Australian amateurs a news service which is unequalled in coverage anywhere else in the world.

If invited, both Ron and I are prepared to continue as the Federal Tape Co-ordinators for the next 12 months.

BILL ROPER VK3ARZ
ON BEHALF OF THE FEDERAL TAPE CO-ORDINATORS
RON FISHER VK3OM AND BILL ROPER VK3ARZ

Have you advised DoTC of your new address?

90.04.18 ANNUAL REPORT OF THE GENERAL MANAGER & SECRETARY FOR YEAR ENDING 31ST DECEMBER 1989

The Executive Office exists mainly as a vehicle created by the Divisions to provide those member services, such as Amateur Radio magazine, the Call Book, membership fee processing, Customs certification, etc., which can be most cost efficiently carried out on behalf of the Divisions by a central body.

1989 was a year of consolidation of staffing, hours and procedures in the Executive Office.

Despite a lack of adequate resources, the outstanding backlog of work from previous years was almost brought completely up-to-date. With the completion of the clean-out of years of accumulated rubbish, re-arrangement of office furniture to maximise usage of the inadequate space available, finalisation of the filing systems, and rationalisation of the tasks performed, the office is now running much more efficiently than in previous years.

Some of the major achievements of the Executive Office during the year include:-

Installation and use of a facsimile machine

Installation and programming of the new membership database computer.

Sorting out and transferring of the remnants of the Federal MagPubs operation back to this office.

Publishing of the 1990 Call Book.

Eradication of the five year backlog of contest trophies.

Commencement of compilation of instruction manuals for office tasks

Placing of VHF Communications magazine operation onto computer, and making it commercially viable for the first time for many years

Staffing of the Executive Office, which varied during the year because of ill health, and lack of adequate financial resources, currently consists of:

Full time paid employees
General Manager - Bill Roper 70-80 hrs pw

Part time paid employees

Assistant General Manager Ann McCurdy	21 hrs pw
Membership Secretary Helen Wageningen	18 hrs pw
Accounts/Mail Clerk June Fox	20 hrs pw
Clerical Chris Russell	18 hrs pw
Computer Maintenance Earl Russell	6 hrs pw

Volunteer workers

Librarian - Ron Fisher	5 hrs pw

Major problems in the Executive Office during 1989 continued to include:-

Lack of a Federal Treasurer

Insufficient human and financial resources to handle the present work load on behalf of Divisions

Inadequacy of the office itself (eg poor lighting, inefficient airconditioning, lack of space).

I enjoyed the seemingly impossible challenges of the position of General Manager during 1989. However, I do not believe that it is reasonable for the WIA to expect me to continue working 70 to 80 hours a week, and seven day weeks, as I have done for the past 22 months.

Either additional assistance must be provided in the Office, or work currently handled by the Executive Office must be devolved to the Divisions.

I would like to thank the Executive Office staff, those Divisional office bearers with whom I am in regular contact, the many members from all Divisions who have given me encouragement, and particularly the Federal President, Peter Gamble, for the support given to me during my time in this position.

Bill Roper VK3ARZ
General Manager & Secretary

90.04.19 REPORT OF FEDERAL COORDINATOR INTERNATIONAL TRAVEL HOST EXCHANGE FOR THE YEAR ENDING 31 DECEMBER 1989

The International Travel Host Exchange (ITHE) is a voluntary scheme administered by the American Radio Relay League (ARRL) wherein interested radio amateurs are able to meet or host fellow operators from other countries

Your name does not have to be on the list for you to take advantage of such hospitality, and you can do so when travelling around our own country. This is another free service from the WIA.

Send a SASE to the Federal Coordinator if you have an enquiry

I personally hosted two visitors from USA and India during 1989 and I am aware of several contacts by other Australian ITHE participants. One American visitor visited an ITHE participant in nearly every Australian city! After a promising start in 1987, there was no net gain of VK members in 1989. The total Australian membership is still 25, and continued publicity at suitable intervals should improve the situation

Ash Nallawalla ZL4LM/VK3CIT
Federal ITHE Co-ordinator

90.04.20 REPORT OF FEDERAL EMC (ELECTRO MAGNETIC COMPATIBILITY) CO-ORDINATOR FOR YEAR ENDING 31ST DECEMBER 1989

"Amateur Radio" published during the 1989 year EMC Reports in February, July, September and October. One more report has been sent to the Editor entitled "Several EMC Short Stories".

Several OMs expressed in letters and during phone calls their appreciation for the work done.

I pointed out in a letter (dated 17-4-1989) to the Editor, that we should make a definite distinction between the terin "Interference" (to be used only for illegal radiation), and the term "Disturbance" (to be used when insufficient RF immunity of an appliance causes the collision). This is necessary for any legal argument, in order to show from the start who is to be blamed (see West Germany).

The document titled "THE NEED FOR ELECTROMAGNETIC INTERFERENCE STANDARDS" from the Department of Transport and Communication was received and studied. I was pleased to see that the WIA had a chance to point out what our position was as far as EMC is concerned. The reader could also see that the Department now had a correct understanding of the problem.

The European Common Market EMC Standards will force manufacturers world wide to design their products accordingly, if they wish to export appliances to this large market. This development should help Australia as well.

The WIA should perhaps now point out to the Department that, based on overseas experience, Australia should never allow Cable TV Companies to use frequencies which are exclusive international amateur radio frequency bands. Australia should follow the Swedish example. The claim of the cable TV operators, that their system is RF tight, is simply not true. We deal with signals of -144 dBm strength for satellite communication. The worst offenders of the cable TV system are the low quality cables branching off to the user and the coaxial connectors. It is important that cable TV companies know from the start that exclusive amateur radio bands will not be made available for their service. Shifting them later would be far too complicated and costly

Hans F Ruckert VK2AOU
EMC Co-ordinator

Soviets & China Learn About Emergency Communications

When natural disasters occur in Australasia, North America, or Britain, radio amateurs are trained and prepared to provide emergency communications. Their contributions are recognised by local authorities and appreciated by the general community in disaster affected areas

Restrictions on the handling of Third Party Traffic imposed by many government radio administrations have prevented the greater use of amateur radio to provide communications during disasters. The lack of organised emergency communications was highlighted when a devastating earthquake hit Armenia late in 1988, and a group of eager United States radio amateurs offered their services. This sparked interest among Soviet authorities who saw how amateur radio can make a valuable contribution in times of emergency. Earlier this year with assistance from the USSR Radio Sports Federation, and the Red Cross, a new independent organisation called the Soviet Amateur Radio Emergency Service (SARES) was formed.

The SARES has appointed 25 regional co-ordinators to take control of training and disaster preparedness. The International Amateur Radio Network (IARN) has supplied SARES with a portable repeater and HF transceiver for use during training exercises and disasters.

China also is keen to learn all it can about amateur radio emergency communications. IARN Australian director, Sam Voron VK2BVS, has been invited by the China Welfare Institute to address radio amateurs in Shanghai. "They have no first hand knowledge of the use of amateur radio during disasters. The Chinese are very interested in what they've read in magazines and heard about disaster communications provided by radio amateurs in other countries," Sam said. He has played a role in international emergency communications for a number of years including those after numerous earthquakes, hurricanes and tropical cyclones. Sam will explain how radio amateurs can organise themselves in preparation for disasters, when he's the guest of the China Welfare Institute in Shanghai during the middle of May

Jim Linton VK3PC

THE LAST WIRELESS ANZAC

JIM LINTON VK3PC

This month marks the 75th anniversary of the landing on Gallipoli of the ANZACs, when the combined Australian and New Zealand Army Corps did battle during World War I. A group of ANZACs will make a commemorative pilgrimage to Gallipoli on ANZAC Day this year.

A little known aspect about Australia's involvement in WWI is the role wireless played, and how a small group of Australians took wireless to the battlefield and were attached to the British forces at Gallipoli.

ANZAC veteran Hubert (Bert) D Billings, 95, of Glen Iris, Melbourne, tells a vivid story of his pre-war training and role in WWI, which included being a member of the 1st Signal Troop, Australian Engineers. This incredible character was in the 1st Light Horse Brigade, and later joined the Australian Flying Corps, the forerunner of the Royal Australian Air Force. Mr Billings was in the 68th (Australian) Squadron, Royal Flying Corps in England and France. During this later involvement, he was a member of the escort march for Baron (The Red Baron) von Richthofen's funeral in France, on April 21, 1918.

Before WWI, Bert Billings was a Victorian Railways clerk and a qualified telegraph operator. In 1910, the Australian Government passed the "Universal Training Act" which required every youth at the age of 18 to register for military training. It was a part-time three-year training scheme for home defence, and those called up could not be sent overseas unless they volunteered.

Mr Billings said: "I was also one of the first amateur wireless experimenters, with my own call sign, XJP, since 1912, and therefore had no hesitation in selecting army signals to serve in, and was duly posted to the 21st Signal Engineers."

Signalling in those days was mostly by hand-held flags, night-time signalling by a large oil-burning signalling lamp and, in sunlight, by heliograph using Morse Code, he explained. "In 1913, the Government bought the first wireless sets ever in use in the Australian Army. They were known as "500-Watt Marconi Wireless PACK sets" — six were obtained — one to Queensland, two each for NSW and Victoria, and one for South Australia," Mr Billings recalls (See picture on opposite page.) The wireless sets had more than 250kg of gear. In the field they were carried on four pack horses, and needed six men to set up.

Bert Billings Circa 1917

Two 10-metre-tall steel antenna masts were erected 100 metres apart, plus guy wires and earth mats. The PACK sets had a nominal range of 30 miles but, under good conditions, this was exceeded.

Power for the set came from a 500-Watt alternator driven by a petrol engine. These two units were fixed permanently on a steel frame to form a pack saddle to be carried by horses. The receiver used a carborundum crystal detector with battery excitation and, with its massive transformer, was also carried by a pack horse.

Being a young amateur wireless experimenter, Bert was eager to get the first set in Victoria on-air. He said: "We unpacked the set for our unit, and assembled it on the road outside the Drill Hall by referring to the book of instructions supplied by the Marconi Company. No-one knew anything about it, but as I was the only one who had experimented with wireless, I was made senior operator. We erected the station, started the engine, and I called VIM, the Melbourne wireless station then situated in the Domain near where the Shrine now stands, and was very pleased when I got an immediate reply. This was the first time a wireless message was sent by the Army in Victoria, and I am proud to have been the first operator." The instruction book said a station could be set up in 15 minutes but, after plenty of practice, Bert and his colleagues were doing it in five minutes.

During peace time and in the early days of WWI, the 1st Signal Troop was able to go into its training camp as a fully equipped unit with two mobile wireless stations. The camps were held at Broadmeadows, then an undeveloped area on Melbourne's northern outskirts, and the Troop would travel by horse from the signals depot in South Melbourne.

At noon on August 3, 1914, Australians were told: "England has declared war on Germany." The Australian Government later offered a fully equipped and trained force of 20,000 men to serve anywhere in aid of Great Britain. A similar offer by New Zealand, with a commitment of 10,000, came at the same time. About 20 members of the 21st Signal Engineers applied and were accepted for overseas service. Mr Billings recalls that early on August 19, they were sworn into their new unit — the 1st Signal Troop, Australian Engineers, 1st Light Horse Brigade, 1st AIF. Then followed training around Australia and, by October 20, the full AIF was ready, and so were 28 troop ships for them and their horses, and another 10 ships for the New Zealanders. The convoy was guarded by four warships in a trip which took six weeks travelling at 12 knots across the Indian Ocean.

On the night of November 8, the convoy heard that a German submarine sank three warships off the African coast, and sent one of its escorts to assist Early next morning, an SOS was received from Cocos Island advising that a strange warship was approaching — and the signals then ceased.

The convoy was fearful it could be attacked. The cruiser "Sydney" was sent to Cocos Island to tackle the German raider Emden. Listening to the wireless traffic during all this drama was Bert, and his fellow signaller Orm Metcher. "It was with intense interest that we listened to progress reports and movements. Finally, we heard the historic message "Emden beached and done for"," Bert noted in his diary.

The troops arrived safely in Egypt and underwent desert training. On April 1, 1915, the two wireless sections of the 1st Light Horse, and two from the 2nd Light Horse — 30 men and 40 horses — were placed on a ship. It was later explained to them they were on loan to the British Army for wireless communication and would be specially trained by the Royal Navy. This was in preparation for setting up wireless stations to help artillery observers pinpoint attacks on Gallipoli The station with Bert Billings was attached to the Essex Regiment of the British 29th

This is the only known photograph of the wireless station and three who first operated it on landing at Gallipoli, April 25, 1915. Seated is Bert Billings taking a message from Sgt Orm Metcher, with Bill Dobbyns the engineer tending the petrol generator. Photo - State Library of Victoria.

Division, and followed the first landing party at Cape Helles on April 25. In research based on the British War Office records, Mr Billings has found the British simply omitted to bring any wireless stations with them — and the only mobile wireless stations in the whole of the Middle East were those with the 1st AIF. After shelling the Turkish forts on the high cliff shoreline, the troops landed with heavy losses. Sapper Wireless Operator/Mechanic Bert Billings transmitted the first artillery control message to a Royal Navy warship — HMS "Euryalus" — on April 27, 1915. Mr Billings said: "It has always been regretted by me this extra service by Australian soldiers was not recognised by some way, or at least recorded in British and Australian official histories."

On May 25, the Australians got word they were to return to the 1st Signal Troop at ANZAC. The plan to capture Gallipoli and force the Turks back was a failure. In a cleverly planned evacuation over four weeks, the Turks did not have an inkling the army attacking them had been slowly going away. Mr Billings left on the last night, December 19, 1915. The battle of Gallipoli was lost, but the war continued and he found himself in the battle of Romani in the Sinai Desert.

In early October, 1916, he transferred out of the Light Horse to the Australian Flying Corps as an Air Mechanic, with the rest of his service in England and France. The sense of balance which Light Horsemen had helped them easily to adapt to the flimsy aircraft of WWI. The spark wireless sets on the aircraft fed about 20 Watts into trailing aerials which had to be recovered before landing. By the time he was discharged, on March 28, 1919, Mr Billings had served 1682 days, of which 1559 were overseas.

After the war, he studied to become an accountant, and when WWII broke out again, served, this time in the Army as a Captain Auditor. Mr Billings was a cohesive influence which kept together the veterans of the 1st Signals Troop. He proudly held the Troop's banner in the ANZAC Day parades in Melbourne. Although not continuing his amateur wireless activities after WWI, he frequently kept his fist in on a Morse key at his home. The last wireless operator from Gallipoli recently suffered a stroke, some two days before his name was published as being a member of the Gallipoli 75th commemorative party Ill-health makes his joining the return to Gallipoli very doubtful. Through the eyes of his grandson, Malcolm Crook, a tour guide, he has been able to pictorially revisit the area.

Cover Story
continued from page 1

by a 6 Volt accumulator producing 35 Watts of power. The helical coil, shown in the photo, was used for antenna reactance compensation. The aircraft trailed 180 feet of wire as an antenna. The wavelength used was between 120 and 300 metres. The DC power circuit was keyed to produce morse signals. The quality of the spark was observed through the window shown Removal of this cover allowed adjustment of the spark gap. The operating range was about 15 miles to a crystal receiver on the ground

We thank Bill Babb for arranging the photo, and Jim Davis VK7OW for the technical information. Photography – Ashton Grave, Strathmore.

WIRELESS IN THE 1914/18 WAR

THE LATE ARNOLD HOLST MID
VK3OH (EX 3DB)
(SILENT KEY 1975)

Although we have already published extracts from this article — "A Little About Wireless In The First World War" AR p18 August 1985, we thought it appropriate to reproduce it in full, in view of the 75th anniversary of ANZAC We are grateful to Jim Davis VK7OW for supplying this copy. The above reference contains pictures of the Marconi 500 Watt spark transmitter used both at Gallipoli and in Mesopotamia — Ed.

In December, 1915, urgent cables from India were received in Australia and New Zealand asking for the loan of men to help out the scanty communications of her Expeditionary Force "D" operating in Mesopotamia.

Both countries responded to this request and offered to supply and maintain complete wireless units in the field.

So the 1st Pack Wireless Signal Troop was formed. One officer and 54 other ranks from NSW and Victoria. This Pack Troop arrived in Mesopotamia on March 19th, 1916. On April 18th a troop from New Zealand arrived, and both were camped at Makina a few miles from Basra. Each troop supplied 4 pack wireless stations. April 25th saw the first Australian station go up river and attach itself to the 15th Div at Khamisiyah on the Euphrates. On its way it sent and received the first wireless messages handled by the Australians for Expeditionary Force "D".

In March 1916, the Imperial Authorities asked the Commonwealth to increase the wireless establishment in Mesopotamia, so the 1st Australian Wireless Signal Squadron was formed and arrived in Mesopotamia on July 6th, 1916. The writer was member of this squadron.

Those already in Mesopotamia, including the New Zealand troop, were absorbed into the Squadron. It camped at Margil near Basra, and was fitted out with its wireless equipment, horses, etc. It soon became officially known as "The Anzac Wireless".

Meanwhile, by arrangement with the Second (British) Squadron, it had been decided that the Anzac Squadron take over the advanced wireless work and leave the 2nd Squadron any work at the base As it turned out, the Anzac Squadron did the lot. As the Army moved up the Tigris and the Euphrates, so did the wireless, divided into many stations, waggon sets and pack sets, attached to Army HQ, Div HQ, Brigade HQ, Battalion HQ even to half platoons.

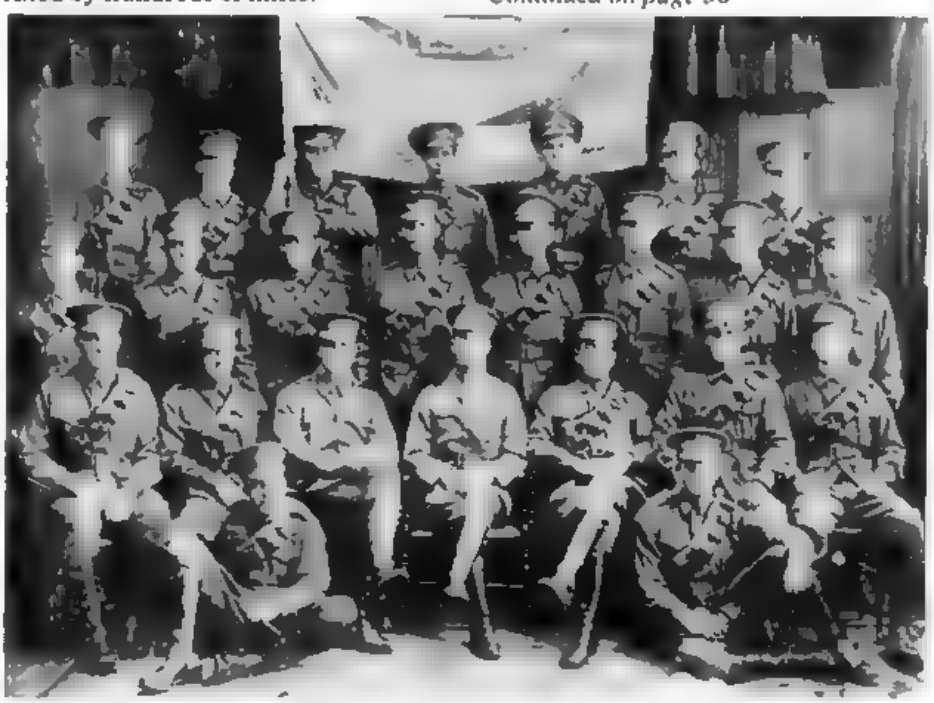
We had three pack sets with the Cavalry Division, and maintained continuous contact with HQ while the cavalry was on the move. This meant that one station at a time halted and erected its two masts, cleared its traffic, and dismantled, packed up and galloped with the cavalry rear-guard, who had waited for it, to catch up with the main body of the column.

So as the Army advance continued to Baghdad and beyond and into Persia with Dunster force, so our wireless stations moved with them and became separated by hundreds of miles.

Now a word about our equipment. This consisted in the main of two sets, one rated at 500W and one at 1 1/2 kW These were made by the Marconi Co in the UK and were very good, reliable and robust. The 500 W set was divided into five separate loads carried as packs on horses or mules.

No 1 load consisted of an air-cooled petrol engine of 2-3/4 HP built by Douglas & Co (the same engine that Douglas used in their motor bike), evenly balanced by an alternator on the opposite side of the saddle. The connecting shaft was detachable. This ran at 1800 revs per minute. Attached to the generator was the rotary spark gap, so designed to produce a

Continued on page 36



Reinforcements for the ANZAC Wireless Section.
Back Row: Sapr MW Wravall (NSW) Sapr CS Howitt (Qld), Sapr H O'Hagan (NSW), Sapr CV Sior (Vic), Dvr AD Eves (NSW), Dvr EW Williams (NSW), Dvr AE Short (NSW)
Third Row: Sapr HA Hill (NSW), Sapr AW Paul (Vic), Sapr AP Watson (Vic), Sapr RF Dodds (Vic), Sapr JAM Tait (WA), Sapr RH Treganowan (Vic), Sapr WJ Morris (NSW), Sapr TP Maher (NSW).
Second Row Dvr R Crawford (NZ), Sapr AM Mitchell (NSW), Sgt RW Parsons (SA), Lieut JD Crawford (Vic), L'cpl Whitehall (NSW), L'cpl JG Bennett (NSW), Sapr HW Stewart (NSW).
Front Row: Sapr WD Tomlins (NSW), Sapr RF Clarke (WA). Photo from the archives of the Museum of Victoria.

THE RFM

NED STOUT VK6**

I suppose that if you were to read this account without knowing how it all came about, you could be forgiven for wondering if it is really true.

First off, I think you should know a bit about me and how I happened to be involved with this particular investigation. I'm not a young fellow anymore, and my education in electronics was obtained in the "old school" and most of what I know has come from reading books and magazines about ham radio. My interest in radio dates from before World War II; my experience began in the old crystal set era and, of course, went through the "valve age" and I'm into the solid-state era now. Well...kinda into it, anyway.

I guess you should know something about my employer, too. He is a wealthy industrialist and has very little understanding of technology, but he sure knows how to make money! I think the reason he likes me is because I am about the same age as he is — and I am self-taught. (Someone not having a technical background often feels it is easier to learn from someone like me, who is self-taught.) Oh yes, we call him The Boss, and he is working hard trying to get a Novice ticket at present.

The other bloke who works with me in the Lab is a young Novice who comes from a farming background. Besides being tall, he is young and healthy and is a genuine "bushie". The Boss and I call him Slim; his surname is Verdigal or something like that, anyway. Slim has a great imagination and is really good at improvising things that the Boss and I dream up...but I'll tell you more about that later

I guess the only other piece of information you need to know is about the Lab. Well, the Boss doesn't want anyone to know its actual location but I can tell you that it is fully equipped with all the latest and best test equipment. Slim and I have never been refused any new piece of gear that we wanted, or a new ham rig to try out. (The Boss is especially keen on trying out new antennas .)

We have a fully air-conditioned four-wheel drive vehicle and often tow a trailer which contains a ten-kilowatt AC generator to power our ham gear when we work in the outback

Well, now, having gone through all that I can get on with telling you about the RFM

One day earlier in this year Slim and I loaded the 4-wheel with all the camping gear we thought we'd need for a little jaunt into the bush. We loaded plenty of tucker, put water in the Jerry cans, and loaded up with seven-strand copper wire, insulators, rope, collapsible poles, etc, and headed up the coast towards Broome. Our task was to set up some place in the desert and make comparisons with the sorts of results we normally got on our home base which was similarly equipped. We had a transceiver (and a spare) and intended using dipole antennas. The main thing we were checking on was to see if any difference exists between using similar antennas over greatly different levels of water table. We know that the water table around the Lab is only 6 or 8 feet (usually) and that the desert has virtually no water table at all (we think).

On our third day out, we were heading generally northeast and were listening to the mobile rig. When we were listening to a QSO between a W7 and a JA2, we gradually noticed a rise in signal strength from both stations. At first, Slim and I didn't say anything to each other about this peculiar rise in signal strength, thinking it was due to QSB. However, as we drove along, the signal strength kept increasing and soon began actually blocking the receiver. I figured that something had gone wrong with either the AGC or the S-meter amplifier circuit. Although we had been quite thorough in checking out our gear before leaving on this jaunt, and had made sure that the mobile antennas were securely fastened, I have to admit that it had been a pretty rough ride, over several rocky outcrops and down along some dried-up streams. In fact, it was only a half-hour or so after I first noticed those extra-strong signals that we stopped for a short break in the bed of one of those dry rivers. When we turned off the ignition, and without any of the road noise being present, the signals were louder than ever. When the dust had settled a bit, I glanced at Slim and found that he was looking at me, too. We both shrugged and rather sheepishly started talking about the strange way the receiver had been acting, but that we hadn't wanted to mention to the other because we were both concerned that the other would think that something was wrong, personally, that is. We had a good laugh about that, but then we settled down and became serious and started to think of ways to investigate the strange signal strengths.

By this time the receiver was practically useless because of front-end overload, so we decided to disconnect the coax feedline at the base of the whip. The signal strength dropped to about 25 db over S9, but there were so many signals on the band (we had tuned up on 15 metres) that we couldn't separate them. The signals were coming from all over the globe without any regard to skip conditions or area of origin. Occasionally we could copy a call sign. I remember hearing an A6X and a C31 and, later, a KH. Then we QSYed up to 10 metres, but had the same sort of results even with the antenna disconnected, so we dropped down to 80 metres CW That band was completely loaded with signals from all over the world! Then we disconnected the feedline directly at the receiver, with the same sort of bedlam continuing, although at a slightly lower signal strength. There seemed to be a heck of a lot of American novices on the band, but we could copy other stations as well; one of them was signing 3V8 — and another was signing 8Q7; there were loads of other call signs.

By this time Slim and I both realized that we were onto something truly out of the ordinary. We decided to pitch camp right then and there and to sort ourselves out. I figured a scheme to check out the situation; the first thing seemed to me to be the requirement for an orderly system, so I made a check list:

a. Try receiving on each of the bands, one at a time.

b. Re-connect the antenna and try transmitting.

c. Move the vehicle away from the river bed in various directions and repeat a, and b, above.

d. Record all results for analysis.

It was while we were going through these procedures that, very hazily at first, I began to recall a story that an old Navy operator had once told me about his experiences during World War II. Although he, himself, had not actually experienced it, a similar extra-strength signal area had apparently been observed by an American aircraft crew flying over northern China. They reported the strange condition through regular military channels but, as the war was soon to end, there was not a great deal of interest or follow-up to the report. Later, after all the records had been security de-classified, the world political situation changed, and the subject was dropped.

After we got back to civilisation (some two weeks later) we told The Boss about our experience He made us write it up and made copies of our logs and sent all this away somewhere (I don't know where) and that was all there was to it.

I haven't forgotten our little caper, I can assure you. As I thought about it more I recalled little snippets of information that I dredged up from the murky depths of my mind; I recalled that the Chinese were supposed to have given a descriptive name to their particular strong signal area; I think that, translated into English, it was something like Radio Frequency Magnet and I have always thought of it as The RFM. The Boss has said that Slim and I can go back into that river bed again, but he wants to come along! (He probably thinks that I made all this up.) **ar**

Wireless in the War

From page 34

synchronous gap with the alternator frequency. There were 24 studs on the disc and this gave six sparks a half cycle of the alternator (50 - 60 cycle), so this produced a very good note easy to read through the static noises.

No 2 load — two boxes containing the transmitting and receiving gear. When in use, one box was placed on top of the other. The top box contained the receiver, the key and portion of the transmitter. The bottom box contained a closed iron core transformer, the HF closed circuit, Leyden jar type tubular condensers and RF chokes.

No 3 load. Two valises containing rope guys for two masts, aerial gear and copper earth mats.

No 4 load. Sixteen sections of tubular steel masts when jointed to each other made two masts each 30 ft high.

No 5 load. Spare parts, stocks of petrol and oil.

The personnel of a Pack Station were one NCO in charge, a corporal in charge of transport, six operators and five drivers — all mounted. Each driver had a pack horse to lead and look after. Each operator had a number of duties in erecting and operating the station, long hours on watch and needed considerable skill in Morse. For all this extra, the Army paid him 1/- a day less than a driver. A pack set took about 7 minutes to erect, when the lads got a move on.

The receiver employed a Carborundum Crystal detector with bias provided by a couple of dry cells through a potentiometer. The circuit was very simple: A tuned aerial inductance and condenser, a tuned closed circuit parallel tuned with a small condenser, crystal detector and high impedance head phones. The frequency range was 300 metres to 1000 metres. We used 700 metres throughout the war. All messages were in 5 letter cypher. We were not permitted to use plain English. We used the "V" sign for "from" not "DE".

The 500W pack sets had a guaranteed daylight range of 35 miles but we worked 2 to 3 times that in daylight, and at night time up to 200 or 300 miles.

Our other type of set was a 1.5 kW Wagon set and consisted of two limbered wagons, each drawn by teams of six horses driven postillion fashion. Two masts, 70 ft high when erected, were carried in sections. The receiver was similar to the 500W set, but the transmitter had a 7 HP water cooled engine made by Douglas. The alternator was larger than the 500W set as were also the components of the transmitter. The low voltage supply from the alternator to the transformer primary was broken by the operating key in both types of sets.

Throughout our service in Mesopotamia and Persia of more than 3 years, we transmitted and received countless thousands of messages of vital importance to the Army operations without delay or error. In this we were greatly helped, because a large proportion of our operators were ex Post Office or Railway Telegraph operators. A few, such as the writer, were "Wireless Hams" or in today's language "Radio Hams".

I include extracts from letters to our unit received after the War, from HR Hopwood (CGS to Sir Stanley Maude)

"...The work of the Anzac Squadron was beyond praise. I believe that I am absolutely correct in stating that no single instance occurred in which there was failure to transmit, without loss of time, any message entrusted for despatch. Especially was this the case early in 1917 during the operations which preceded General Maude's final advance on Baghdad in March of that year, while the work of the unit during the actual advance was admirable."

From General Wm Raine Marshall.

". It was, therefore, a special source of pride to have under my command in Mesopotamia an Australian & New Zealand Wireless Unit. During their four years service with the Mesopotamian Expeditionary Force they were distinguished by efficiency in the technical part of their work and by the grit and unfailing cheerfulness which were characteristic of all ranks in carrying out their duties. I know what a high opinion my distinguished predecessor (Sir Stanley Maude) entertained of this unit, and I am proud to endorse the opinion of that great soldier." **ar**

BOOK REVIEW

"US Disposal Reference"
Ian O'Toole VK2ZIO
Reviewed by Evan Jarman VK3ANI

In many an amateur shack lies a pile of military surplus equipment. For many, this equipment was the vehicle into the hobby, but has not been used since acquiring the S line from Collins. Now its sole function, if any, is to keep the door open.

Occasionally it gets passed on at radio club auction nights, or conventions, to a novice trying to get on the air and not go broke! Alternatively, a nostalgia buff or collector acquires the equipment.

What usually happens is that some piece of equipment is lying around with just a number and you cannot be sure of what it is or its capacities.

Ian O'Toole (VK2ZIO) has come to the rescue. He has compiled a disposal reference guide. There are two volumes, British and American, with a third on Australian made gear in preparation. They are a montage of original advertisements for the equipment sorted by numeric/alphabetic order. Just browsing through the American manual (Volume 2) brought back so many memories.

The equipment is basically World War II surplus, although names like Hallicrafters and Hammarlund appear with gear aimed specifically at the amateur market. The old favourites are there, AR88, BC348 etc, along with the more obscure; more than 700 items.

One of the more novel specifications shown is the price: from 98 cents upwards for complete equipment.

The RCA AR88N is $49.50, a price that won't be seen on communications receivers these days. Alternatively, some of the uses that various advertisers say their products can be put to are at least novel: A Sonobuoy that converts easily "for quick and easy two-metre FM fun", for example. Another is the multiplicity of parts or uses for a B-29 bomb sight described as "an invaluable machine for experiments, laboratories, physicists, tech institutes, schools, engineers, research men, repair men, mechanics, manufacturers, opticians and electricians", and goes on to list the types and number of parts that it contains. About the only use they left off was for dropping bombs — its originally designed function.

The ultimate for appliance operators is the trader who offers a complete station on HF, all bands with full power. Included is the shack, fully constructed, with 10kW generator. A deal that no one has yet matched. For those with an interest in identifying war surplus, or the nostalgia buff, this manual is a good source of information or memories. Full details are available from Ian O'Toole, 222 Old Northern Rd, Castle Hill, 2154. Phone (02) 680 2112

TECHNICAL CORRESPONDENCE

VCR Interference Solutions

I read Ray Turner's letter in February AR, concerning his VCR TVI problem. Instead of writing to Ray I felt it may be desirable to write in a general way about the problems that he is experiencing and perhaps a number of other people with the same troubles may be helped to find ways to overcome the insidious problems that VCRs experience.

Firstly, as observed, putting low-pass filters in the transmitter output did not help since it would appear the transmitter was clean as no TV sets experienced the problem. Second no observable improvement was achieved through using a high pass filter on the VCRs. The question has now to be asked, what quality were the high pass filters? There have been a lot of high pass filters on the market over the years but only in more recent years have good homegrown Australian filters been available — admittedly at higher prices compared to imported junk. You can expect to pay between $20 and $55 for good quality filters. The preferred type is a combined high pass filter with a 1:1 ferrite cored RF transformer which acts as a braid breaker. This combination works well in most cases, and is to be preferred to filters that are either a high pass or a braid breaker but do not combine the two. You may need one of these but I suspect that it will not completely cure the trouble.

The next step, having fitted one of these combination filters is to go and buy yourself a ferrite rod about 20cm x 9.5mm from Jaycar or Dick Smith or whoever is your favourite supplier, and wind the power cord over the ferrite core starting at one end and finishing at the other. Wind it tightly and tape it in position. You may need also to wind the power lead of the TV set onto a ferrite rod too. Wind the filter up close to the VCR so only a small amount of lead hangs out the back of the VCR.

This combination has now filtered both the TV antenna coax lead and the power lead and hopefully removed most if not all the troublesome RF out of the VCR.

If this combination has achieved some improvement, make sure that there are no extension leads on the TV to extension speakers etc, as they will pick up the TX RF quite well.

If you still have trouble I would suggest that you are getting to the stage of having to shield the VCR. This becomes more difficult involving bonding of various panels, putting aluminium cooking foil over some areas of the VCR and earthing them to some frame metal. However, many VCRs have mostly plastic cases and good earthing spots are hard to find. Keep in mind that double insulated devices should not have exposed metal, so the shields will have to be inside the unit, but make sure nothing will short out the works, as if it does you won't have to worry about interference/lack of RF immunity in the VCR. Sometimes even just wrapping the VCR in foil over the outside and not even earthing it has been known to succeed.

80 metres is a bad band for RF immunity problems with VCRs as much of the video signal from the heads is low level RF in the general range 500 kHz to 4 MHz or thereabouts so no wonder 80 metres gives it a caning. It is not an impossible task to overcome the interference/immunity problem as TVs, audio equipment, and VCRs are regularly made to work successfully almost beneath Radio Australia's antennas at Shepparton where the ERP is of the order of 2,000,000 watts on 6 megahertz.

Good luck with it Ray, suggest you endeavour to get your antenna as far away as possible from other TV/VCR combinations, although this may be difficult as you appear to live in a batch of flats. I would appreciate knowing how you go with it.

Rodney Champness VK3UG
17 Helms Court Benalla 3672
ar

Scout Radio & Electronics Service Unit (Victorian Branch)

During Easter 1990 many of the Venturers in Victoria will be taking part in the 1990 Hoadley Hide. As a part of the support services for this large event, the Scout Radio & Electronics Service Unit will be providing radio communications in the forest area involved.

To the un-initiated, the Hoadley Hide is a Venturer Hiking/Activity competition camp, conducted during Easter each year Venturers are the section of the Scout Movement consisting of young people aged from 14 — 18 years.

The object of the weekend depends on your point of view

To the Venturers the object may be to cover the maximum number of activity sites in the shortest distance, meet new friends and have fun. This must be achieved while keeping the team fit and healthy

To the Leaders the object is to provide the means for the above not forgetting safe, healthy, secure camping sites and keeping track of around 900 Venturers in the forest. This also includes co-ordinating the movement of over 1500 people into and out of the forest; this number includes Venturers and their parents transporting them, Rovers (the 18 — 26 age group that provide many of the activities), Leaders and families.

To the Radio & Electronics Service Unit the object is to provide the radio comms to support the leaders in the above. It doesn't end there however, the comms team are often called upon to fix all sorts of other radio and electronic related problems, the help is provided when possible.

To provide the support required, an army of radio operators and equipment is moved in to the forest and set up. The bands used are 80m HF to provide comms over distance and mountainous terrain, 11m (27 MHz CB) to provide for comms to leaders with existing CBs in their cars; 2m VHF FM to provide high quality comms over the local area. To assist the 2m operation this year's Hoadley Hide should see the first airing of the new Scout portable repeater VK3RSR.

The five base stations are generally staffed by 3 operators each. The operators roster themselves so to ease the work load and to eat, sleep etc. Normally the bases operate for around 16 hours per day with the HQ base maintaining a 24 hour watch.

The Radio & Electronics Service Unit would like to hear from any interested people whether in the Scout movement, or just believing in the ideals of Scouting, who are interested in assisting with this activity or other service unit activities. The Scout Radio & Electronics Service Unit (SR & ESU) aims are to provide communications, training and advice to the Victorian Branch of Scout Association, on radio and electronics related matters.

For further information please contact Philip VK3JNI Home Phone (03) 438 3013.

HOW'S DX

STEPHEN PALL VK2PS
PO Box 93 DURAL 2158

Spratly Islands 1S

It has been reported from several amateur sources and DX bulletins, that activity from this group of territorially disputed islands will take place in the second part of March. RL8PYL was organising the group of four USSR, two Japanese and four Vietnamese amateurs to travel to an abandoned Vietnamese military base aboard two helicopters with 10 soldiers and a doctor When you read this, the event has either taken place or not. Propagation-wise there should be no difficulty working them, provided you are able to overcome the QRM in the dog-pile

International Marconi Day

April 21 has been designated as International Marconi Day, and it will be celebrated from 0001 to 2359 UTC by activating at least 14 special-event stations in the world, working from various places which have special significance in Marconi's wireless activities. The stations are K1VV/IMD, VE1IMD, VO1IMD, EI2IMD, IY4FGM, GB0IMD, GB2IMD, GB4IMD, IY0TCI, IT1TTM, ZS6RSA, DA0IMD, GB2MDI, F?IMD. There is a special award if you work at least 10 of the above stations. Apply for the award with a GCR list and $US5 00 or 10 IRCs to CRAC, PO Box 100, Truro, TR1 1RX, England.

Bouvet . . . Again

If you worked them, send your card with the necessary SAE+IRCs to: Club Bouvet, Box 88, N-1361 Billingstadsletta, Norway Those who listened on the expeditions' frequencies will remember the bedlam, QRM and jamming. Because of the split frequency, many stations transmitted on the wrong (listening) frequency, not knowing the correct method to use two VFOs. As a result, the FCC — the equivalent of our DOTC — has issued 240 written warnings to US amateurs for out-of-band activity It looks like authorities in some countries do monitor the amateur frequencies

Crozet Is FT-W and Kerguelen Is FT-X

New operators are now active from these islands. FT4WB Jean Louis is on Crozet, FT4XA is on Kergulen. QSL card for both of them to. FD6ITD Jean-Pierre Berthomieux, 29 rue du Cammas, F-31650 Orens de Gameville, France. FT5XH FT4XG and FT4XI are also on the island. QSLs for FT5XH go to Jacky Calvo F2CW, Le Bois de L'essard, Nercillac, F-16200 Jarnac, France

DX QSLing

In the last issue of "AR" I gave you some hints what to do to make sure that your QSL card gets safely to its destination. Here is another tip: Your innocent-looking envelope, on which you have affixed a nice variety of colourful Australian stamps, can become the prey of a fanatical stamp collector. (Yes, besides amateur radio, there are also other fanatical hobbyists . . .) Advice: Some of our post offices can issue you with a franking machine sticker instead of stamps. Stamp vending machines at bigger post offices will issue you similar stickers. By franking your overseas letters in this fashion, you have removed an additional temptation at the other end

WARC bands

Graham VK6RO reports a hive of activity, both CW and SSB, between 24890 kHz and 24990 kHz. The following countries were worked recently in a short space of time: C31, JR7, ZK2, UL7, UD6, XW8, UQ1, G0, UF6, UW9, SV5, S79, XV2, DU3, 9V1, LY2, HL1, RA2, J37, UH8, LZ1, UO5, UG6. Please note that the ARRL Board has accepted the recommendation of the DX Advisory Committee that the 5BDXCC can now officially be endorsed for 12 and 17 metres (7 band DXCC). The 30-metres endorsement is still pending.

Future DXpeditions

It appears that the abandoned DXpedition to South Sandwich Island and South Georgia Island, which was to have taken place with the second Bouvet operation, is now scheduled between November 15 and December 15, 1990. Please note in advance in your DX diary, if you have one.

Bangladesh - S2

Jim VK9NS, who is still prepared to go to Buthan provided he gets the necessary visas etc, is very hopeful that in the meantime he will be able to operate for a short period from Bangladesh in the near future.

Juan Fernandez Island - CE0

Look out for some activity from the island of Robinson Crusoe. A group of operators from Chile intends to activate the callsigns CE0ZZ and XQ0Z during late March and/or early April. QSL to: CE3BFZ: Pedro Barroaso, PO Box 13312, Santiago 1, Chile.

Interesting QSOs and QSL information

To save space, I have omitted the repetition of kHz after the frequency, and UTC after the time All frequencies are in kHz, and the time is in UTC, unless otherwise indicated

FY4FC Aimee (yl exFK8FA) 14MHZ SSB at 1025. QSL to: Box 447 Mont Dore, F98607, French Caledonia AP2TN Tariq-14022 CW at 2110 QSL. Tariq Nasseer Khilji, F-289 Rehman Pura, Lahore 16, Pakistan. A92EV 28490 SSB at 0605 QSL PO Box 833 Bahrain, Middle East. TA5L 28495 SSB at 0548. QSL. GAR 54 Adana, Turkey P4/N4NXF Danny 28MHz SSB at 0330. QSL. PO Box 2209, San Nicolas, Aruba

JP1DMX/HI8 Saya 21205 SSB at 0505. QSL. via JA1ELY via Bureau. PJ2HB Hank 14151 SSB at 0654. QSL. WA2YMX, Mark S Horowitz, 3465 Carrolton Av, Wantagh NY 11793 9H1HV Silvio 14156 SSB at 0730 QSL: Bureau. 3W3RR Roman 14165 SSB at 1212. QSL. Bra Ven Kong, Box 308, Moscow, 103009, USSR. Send two IRCs. VP2VE Lee 14111 SSB at 0940. QSL to: WA2NHA: Howard Messing, 90 Nellis Drive, Wayne, NJ 07470. YJ0ABF Berthold 28006 CW at 0224. QSL: via DF5WA via Bureau AP2ASA Asim 14228 SSB at 1237. QSL: via Bureau or direct. YJ0AHM Hilde(yl) 14200 SSB at 1317. QSL via DL6UF via Bureau. VR6JR Jim 14222 SSB at 0651 QSL: via G3OKQ. J Russel, Greenfingers, Oyster Lane, Byfleet, Weybridge, Surrey, England. VR200PI/JR Jim 14222 SSB at 0650 QSL: via KB6ISL. Dr G O'Toole, 9605, San Gabriel Ave, South Gate, Ca 90280 USA. LQ9DX Ser 14204 SSB at 0704. QSL: PO Box 36, Buenos Aires, Zip 1834 Argentina. A35KB Kevin 14222 SSB at 0606 QSL: PO Box 1, Nuku-Alofa, Tonga. WZ6C/ST4 Erik 14222 SSB at 0501. QSL. W4FRU John H Parrott Jr, PO Box 5127, Suffolk, Virginia 23435 USA. C21DD Dumas 21205 SSB at 0512 QSL:PO Box 177, Nauru. 9H1EU Tony 14243 SSB at 0707 QSL:WA4JTK. Alan E Strauss, 17401 NW 47th Ave, Carol City, FL 33055 USA. 5W1AU Phillip 14222 SSB at 0511. QSL. W6KNH, Clyde J Schoenfield Jr, 42 Donald Drive, Orinda, CA 94563 USA. 5B4SA Lawrence 14222 SSB at 0627 QSL:Lawrence Kymisis, Box 1531 Nicosia, Cyprus. VY1FF Gerard 21205 SSB at 0544 QSL: VY1AU William Champagne, 12 Tamarack Dr, Whitehorse, YT-Y1A 4W2 Canada DK1CE/H44 Ulmar 21191 SSB at 0515. QSL via DJ9ZB Franz Langner, PO Box 150 D-7637 Ettenheim, West Germany V29C Bruce 14227 SSB at 1211 QSL. W2GBX, Bruce Siff, 2069 NE Collins Cir, Jensen Beach, FLA 34957, USA. OD5FK 14222 SSB at 0634 QSL. PO Box 16-5443 Beirut, Lebanon JT1BY Tom 14222 SSB at 0625 QSL. PO Box 470 Ulan Bator, Mongolia. YJ8M Marek 14222 SSB at 0615. QSL PO Box 217 Port Vila, Vanuatu. SV9AHZ John 14243 SSB at 0802 QSL: PO Box 92 Hania, 73100 Crete, Greece

4UVIC 21028 CW at 1226. QSL: via Bureau (OE) HL9HH Harry Herr, PO Box 3695 APO San Francisco 96366 USA. JT1BC Lham 14048 CW at 0940. QSL via Bureau. CN8ST Tariq 14021 CW at 2030. QSL. F2CW (see address in this issue) EA8AB Paco 21014 CW at 2000. QSL via Bureau. PJ2AM Art 14005 CW at 2300. QSL via Bureau.

RTTY News

Some of you asked me to provide interesting RTTY information. As I do not operate in this mode, I asked the doyen of the RTTY enthusiasts, Syd Molen VK2SG, to assist me, and he agreed. Here is a brief picture of Syd. Started amateur radio in 1947 and became an HF DXer. Late in the 1960s, RTTY started to become a new mode of DXing. Syd, together with another RTTY enthusiast well known in VK2, Bill Storer VK2EG, founded ANARTS —The Australian National Amateur Radio Teleprinter Society, which is the national body of RTTY, Amtor and a mixture of Amtor/Packet data modes. Packet later developed its own national society. Syd started to send out DX notes on RTTY around 1972. His transmission is now a regular weekly news bulletin on each Friday on the RTTY frequencies, usually on 14 MHz, and reaches every RTTY mode operator around the world. Here is a sample of rare DX in the RTTY mode as published by Syd. 4K2OIL 14094 at 0015. QSL Box 341 Omsk, 644099 USSR. ZP6EM 14091 at 0110. V5MAH 14085 at 0148. VP8BFH 14093 at 2040. QSL Box 60, Port Stanley, Falkland Is. TZ6VV 21093 at 2040. JW7SP 14082 at 0149. QSL to: LA3T. HR2JAE 21090 at 0021. QSL Box 2020 San Pedro, Sulva, Honduras. J28TY on 28097 at 1147. EL2MR 28087 at 1627. QSL to: WA8LKS. ZD8BOB 21088 at 0838. QSL: Box 2, Ascension Is, South Atlantic. D2ALA is now QRV on RTTY. JX9CAA will be on Jan Mayen until October. Kergulen and Crozet should be active now; all bands and all modes. Question. RTTY and DX enthusiasts! Is this what you want? Shall we continue? Drop me a line.

From Here and There and Everywhere

Bing VK2BCH is on the mend. He put in a brief appearance on one of the nets early in February, but it will take some time before he is fully fit. IAØPS was an Italian station on the "Terra Nova" Antarctic Italian Research Base. RI1OA was a very strong signal from Uzbekistan on 14226 at 1240. Please note: The Indian QSL Bureau is not functioning. All QSLs to Indian stations to be sent direct, or to QSL managers, otherwise no QSL from VU. D2/LU6ELF and ZS9 (Walvis Bay) have now been accepted by the ARRL DXCC committee as a DX country. Walvis Bay cards as far back as 1977 are in order but will be accepted only after June 1. YS1MAE was heard on 14222 at 0537. Pete KN0E/KH3 has changed his callsign to AH3C. AP2UR was heard in a CW QSO on 14005 at 1157. Shanti 4S7WP wants his cards to be sent to Box 80, Colombo, Sri Lanka. The "TADZHIK DX Club" was formed recently. President is Alex UJ8JJ. Secretary is Alex UJ8JV, and vice president is Alex Rubstov, UJ8JCQ. His address is PO Box 1102, Dushanbe 734032 Tadzhikistan USSR. The object of the club is to activate rare oblasts in a number of southern republics, ie UI, UM, UJ. They want to introduce suitable awards and are looking for small donations in the form of IRCs and small green stamps. In return they promise you a numbered certificate. The address of the VQ9 QSL Bureau is Diego Garcia ARC, Box 15, NSF, FPO San Francisco, 96685 USA. Received a letter-type QSL from Simon Chan S79SC with lots of technical information on FEBA radio, a Christian broadcasting station with programmes in 29 languages to many countries around the Indian Ocean. Incidentally, despite the modern up-to-date broadcasting equipment, Simon's amateur equipment is a 1969 KW2000A.

The international DX Conference of the Spanish LYNX DX Group will be on April 28-30 in the Mediterranean town of Benidorm. KX6DC has had his callsign changed to V73AZ. Frank Hine, VK2QL, one of the big DXers of the past (mostly on CW) said in his notes, which he sent to me, that it was he, as VK4QL in Townsville, who originated this DX column in the early 1950s, when still on active service with the RAAF. W9GW was active for one week as T32BN. UR2QD changed its callsign to ES1QD. Matts SM7PKK is now in American Samoa as KH8/SM7PKK. He survived Wallis Island, where he ran out of money. He hopes to go to Niue ZK2 before attempting the voyage to Tokeleau. Tony VK9LA wants his QSLs to be sent to DJ5CQ. One-line info: ET3PG is on the air, no further details. JD1YAA was active in the CW mode on 10 MHz. VK5NVW advises that he and VK6JS are checkpoints for the "CQ" Magazine, and can check QSL cards for most "CQ" awards. For further info, send a large SASE to any of these two stations.

Interesting QSLs Received

Direct QSLs: 3D2PL, JY5FA, KH0AC, 3B8FV, YK1AA (return from operator in three weeks) BZ4RCC (return from operator in seven weeks) YB1BGD (return from operator SAAD in four weeks) KH6JEB/KH7 (return from operator in two weeks).

Bureau QSLs: FY5AN (sent direct, received through the Bureau, seven months). 9H1GY, 9H4R, H44/DL2GAC, CE6EDZ, HC8DX (two years and three months), 5W1HV.

Route unknown: FR4FD, JW1MFA, PJ1B, 8P9EM, 9X5NH.

Answer to the Big Question

Following my appeal to the readers of this column in the January 1990 issue of "Amateur Radio" to make comments and voice opinions about the usefulness of this column, I received many more letters, notes, QSL cards with comments, than I expected. Instead of a dozen or so, I received 37 replies from the following: VK2: DLB, QL, DID, CWS, DEJ, BHS, FNJ, DTH, DOJ, APD, VFT, RZ. VK3: DVT, ZJ, AJU, EBP, VQ, LDT, JI, AQZ. VK4: DA, TT, OD, OH. VK5: BAS, LB, NVW, RK, KL, WO. VK6: AMK, NV, NE, RO, AGH. VK7: CV, YP. No comment from other call areas, nor (to my surprise) from any SWL reader. Here is a sample of what the readers say about the column. "I read the column before the ham ads." "The column is up to date with news that a DXer needs." "For me the DX column is the only worthwhile part of AR." . .

Not one of you said that I should change the format, but many suggested good ideas for improvement. All of you said, in quite definite terms, that I should continue as editor of the DX column. Here is a summary of the suggested improvements:

1. You want early DX news on upcoming DXpeditions. This is difficult because of the lead time of "AR" (average four weeks) and because this news appears on the bands only about two-three weeks before it happens, unless it is planned in all detail, like the one for Bouvet, which expedition was planned for more than six months.
2. You want full QSL information with complete postal address. This takes up space and will cut down the number of QSL infos published per month.
3. You want more DX information on 160-80-40 and WARC bands.
4. Some of you want RTTY news.
5. List of QSL managers' names and addresses with regular updates.
6. QSL cards received to be grouped into direct and Bureau QSLs.

To achieve all this, I need your assistance, which will shorten my time in monitoring the bands. Please send me detailed information of your rare DX QSOs and QSL addresses, and any other DX news which you think should be shared with the other DXers. I thank you again for your splendid effort in sending your replies to me.

Many thanks for the assistance received from VK2SG, VK2FNJ, VK2QL, VK4DA, VK4OH, VK5BAS, VK5KL, VK5BS and VK5NVW, and the DX bulletins. "QRZ DX" and "The DX Bulletin". Please keep the information rolling in.

Late news. Jim VK9NS has received permission to travel to Bhutan and hopes to operate from A5 at the beginning of April.

Good DX and 73

VHF/UHF AN EXPANDING WORLD

ERIC JAMIESON VK5LP
9 WEST TERRACE MENINGIE 5264

All times are Universal Time Co-ordinated indicated as UTC

Australian Amateur Bands Beacons

Freq	Callsign	Location	Grid square
50.056	VK8VF	Darwin	PH57
50.066	VK6RPH	Perth	OF78
52.200	VK8VF	Darwin	PH57
52.320	VK6RTT	Wickham	OG89
52.325	VK2RHV	Newcastle	QF57
52.330	VK3RGG	Geelong	QF21
52.345	VK4ABP	Longreach	QG26
52.370	VK7RST	Hobart	QE37
52.420	VK2RSY	Sydney	QF56
52.425	VK2RGB	Gunnedah	QF59
52.435	VK3RMV	Hamilton	QF12
52.440	VK4RTL	Townsville	QH30
52.445	VK4RIK	Cairns	QH23
52.450	VK5VF	Mount Lofty	PF95
52.460	VK6RPH	Perth	OF78
52.465	VK6RTW?	Albany	OF84
52.470	VK7RNT	Launceston	QE38
52.485	VK8RAS	Alice Springs	PG66
144.400	VK4RTT	Mount Mowbullan	QG62
144.410	VK1RCC	Canberra	QF44
144.420	VK2RSY	Sydney	QF56
144.430	VK3RTG	Glen Waverley	QF22
144.445	VK4RIK	Cairns	QH23
144.445	VK4RTL	Townsville	QH30
144.465	VK6RTW	Albany	OF84
144.470	VK7RMC	Launceston	QE38
144.480	VK8VF	Darwin	PH57
144.485	VK8RAS	Alice Springs	PG66
144.530	VK3RGG	Geelong	QF22
144.550	VK5RSE	Mount Gambier	QF02
144.600	VK6RTT	Wickham	OG89
144.800	VK5VF	Mount Lofty	PF95
432.160	VK6RPR	Nedlands	OF78
432.410	VK1RBC	Canberra	QF44
432.420	VK2RSY	Sydney	QF56
432.440	VK4RSD	Brisbane	QG62
432.445	VK4RIK	Cairns	QH23
432.445	VK4RTL	Townsville	QH30
432.450	VK3RAI	MacLeod	QF22
432.535	VK3RMB	Mount Buninyong	QF12
432.540	VK4RAR	Rockhampton	OG56
1296.410	VK1RBC	Canberra	QF44
1296 420	VK2RSY	Sydney	QF56
1296.440	VK4RSD	Brisbane	OG62
1296.445	VK4RIK	Cairns	QH23
1296.480	VK6RPR	Nedlands	QF78
2304 445	VK4RIK	Cairns	QH23
2306.440	VK4RSD	Brisbane	OG62
10445 000	VK4RIK	Cairns	QH23

? operation doubtful

SIX METRES

The six-metre band has been relatively quiet for the past month. From the VK5 viewpoint, there have been the usual VK2 and VK4 openings from time to time, and at least five observed openings to JA.

Thanks to John VK4ZJB who phoned on 7/2 to advise that he, VK4ZAL, VK4ZNC and VK4KU had been successful on that day at 0330 in working Terry V73AQ (10 Watts) from the Marshall Islands. Good work. Also pleasing to know the Marshall Islands are still active.

On 11/2 from 0100 there were wall-to-wall JAs from JA1, 2, 4, 5, 7, 9 and 0 with many signals 5x9. The dogpile on 50.110 was due to attempts to work VK9TAX who was 5x9 in Japan. The VK9 location was not known but could have been from the Cocos-Keeling group of islands in the Indian Ocean. Another station being called was VK9PN mobile, possibly from the same area. At the same time the JAs were working a few VK2s and VK5s.

East Coast of USA

With a degree of excitement in his voice, John VK4ZJB phoned on 27/2 to say that day between 0000 and 0045 Brisbane stations had worked to the eastern States of the USA with signals to 5x5. Those involved were VK4ZAA, VK4ZAL, VK5APG, VK4GC, VK4ZNC and VK4ZJB who worked WA2UFZ, N2HZW, KB2FDZ, WB2BZB, WA2BPE, WA8EON and N8JGM, in addition VK4ZNC worked W1APO while VK4ZJB excelled himself by working VE3KKL in Canada. Congratulations gentlemen, a very good effort.

I suppose it was to be expected some good contacts would eventually evolve in the light of so many strong solar flares being observed on 50 MHz during the past few days, the S meter had risen to S5 several times on solar noise at Meningie. Therefore, everything seems to be in readiness for some excellent DX on 50 MHz during March/April and possibly May.

Austria on Six Metres

Per favour of Graham Thornton, VK3IY, Managing Editor of AR, advice has been received from Dr Ronald Eisenwagner, OE4REB, that amateurs in Austria have been granted the use of 50.000 to 52.000 MHz from 1/2/90 to 31/1/91, with the following restrictions: All modes with bandwidths of 3 kHz or less; maximum power 25 Watts measured at the transmitter antenna terminal, horizontal antenna with a beam width of 100 degrees or less; no mobile, portable or air-mobile operating; there are area restrictions during the operating hours of TV-1 (generally 0900 to midnight local time) for most of OE3, all of OE1 and OE4 and parts of OE6. Optional extension of operating beyond 31/1/91 will depend upon the 12-months' practical experience.

Thus another European country becomes available for six-metre contacts. It is not known how many amateurs are affected by the restrictions — it seems highly likely that the unrestricted zones will be areas of low population density but there may be some stations with sufficient interest in the outer areas to make contacts to Australia possible during a European opening.

DX-pedition

In a very brief note, Steve VK3OT advises that GB4MSS will operate from UA0 in grid square NQ59CN from March 1 to April 15, 1990, operating with CW on 50.105 and SSB on 50.110. No other details.

1000 Mobile Contacts

Graham VK6RO has written to say that on 13/2/90 at 0609 he worked JA0BBE on 50 MHz CW for his 1000th contact to Japan using his mobile station with an output power of about 10 Watts from his TS68ØS and a vertical quarter-wave antenna!

Graham said his first QSO with Japan was on 10/10/79 with 2.5 Watts. During the 1000 mobile contacts modes used have been AM, FM, SSB and CW.

Well, what can one say? It must take a very dedicated operator to achieve that goal from the cramped conditions of a car and I am sure the VHF fraternity will say well done for that effort, Graham.

From the USA

From Bill Tynan's "World Above 50 MHz" in QST, comes advice that at last a breakthrough has occurred to the northern areas of California from Europe when K6QXY, WA6BYA, W6JKV and K6MYC all worked FC1BUU on 28/12/89.

KL7JKV from Alaska reports having more than 1900 six-metre contacts during the US autumn period. Most contacts have been with JAs, but other areas worked include VK, KH6, KG6, VS6, KHØ, DU, HL, KH4, JD, VE, W and XE. KL7JKV and AL7C have both worked all Japanese prefectures, a significant feat, indeed.

From the same source comes news that Dave W5UN worked 13 new countries in 1989 via two metres EME. They were 4J1FS, CT3M, T2ODJ, T3ODJ, HC5K, V63MB, HD8E, F6EYM/CT, ZK1RS, FK1TS, ZD8MB and HL9TG.

Bill Tynan also writes that "ever since W1HDQ and other east-coast stations made

it across the Atlantic on 50 MHz in 1947, VHFers have been speculating on the eventual achievement of six-metre DXCC. Some said it couldn't be done, and most HF DXers, when the possibility was posed to them, simply scoffed."

However, despite the many obstacles, it seems that 100 countries worked on six metres has been finally achieved. VE1YX submitted the first DXCC application to the ARRL in early December 1989 and K5FF, W5FF, K8WKZ, W4CKD/8 and K1TOL are also said to be at the 100 mark. The first 10 to qualify will receive 50 MHz DXCC plaques, and all awards will be numbered.

On behalf of Australian amateurs, I congratulate the above operators and others who will shortly follow them with 100 countries. It is a fine effort, only made possible by F2 propagation and probably one of the best solar cycles ever, plus the operators' dedication to the task in hand. The task has been made a little easier by many administrations making 50 MHz available to amateurs in countries never before to have operated on 50 MHz. Despite various restrictions in some areas, contacts have been made with rare countries.

While on the subject of Bill Tynan W3XO/5, I was most unfortunate to miss him during his recent tour of Australia. Bill called at my house on 27/2, the only day I had been absent since Christmas Day — a day when I had an appointment with a medical specialist in Adelaide. Such is the luck of life, but I was most disappointed, as Bill and I have been swapping VHF notes for years.

50MHz DX Standings

For some time now I have been contemplating the best way to handle various 50MHz contacts made during the past few years up to July 1, 1989, when the present expanded operating conditions were laid down. All 50MHz contacts have been listed separately whilst the matter was sorted out. I believe the following parameters are not unreasonable given the varying circumstances which prevailed in different Australian States.

1. Contacts made between the hours of 1500 and 0000 (midnight to 0900 EST) will be accepted from VK1, 2, 3 and 4.

   Explanation: These times seem a reasonable compromise in regard to the operating hours of Channel 0 stations (suggest 0000 to 1500 daily). I have neither the time nor resources to check the operating schedule of every Channel 0 station, particularly when related to the multitude of amateur 50MHz contacts made at various times, especially in 1988/89. From my observations, it seems some stations were given a form of official/unofficial go-ahead providing no interference was caused to Channel 0 television transmissions, and this seems to have clouded the issue.

2. Listed contacts from stations in VK5, 7 and 8 will be accepted at face value.

   Explanation: Although stations in these call areas were limited to a power of 25 Watts during the operating hours of Channel 0 stations, again it is impossible for me to know at what time they could legally increase their power, and I certainly have no means at my disposal to establish what power levels were actually used by any station. However, I do know from my own operating that few contacts were lost due to the use of a lower power level. (I rarely run more than 20 Watts on six metres these days because there exists a potential TVI problem if I do, so I play it safe!).

3. There are no restrictions applied to stations in VK6 or any VK9 call area.

   No doubt my stated views above will not satisfy everyone, but I believe there are enough ifs and buts which apply to 50MHz operation prior to 1/7/89 for some compromise arrangements to be made. After all, those of us who were fortunate to live in areas with none or few restrictions do not really know how WE may have operated with rare DX pouring in had we lived in one of the eastern States. It is easy to make statements from the safe side of the fence!

Equally, I don't want complaints about the 0000 cut-off from eastern States operators. Under the circumstances, I believe this is a fair and reasonable compromise; also, you will have more opportunities than VK5, 6 and 8 to again work the DX from across the Pacific in the coming months, and possibly the next two to three years, thus making up for any shortfall in your original listing.

Having said all that, I now invite operators to submit their lists before June 20 for ALL stations worked — those presently listed after 0000 can go down as "heard contacts" until finally validated by a new contact. For the sake of the record, we need to know who worked who on 50 MHz!

CLOSURE

By the time this is ready, hopefully we will be in the full swing of exotic F2 DX on 50 MHz. For some it will mean rising from bed earlier than usual, as many such contacts will commence around 2200 or earlier, and most will be finished by 2400. During March/April 1989 signal levels often peaked around 2300.

Closing with two thoughts for the month: "By the time parents are ready to enjoy the comforts of life, their children are using them", and "Rose-coloured glasses are never made in bifocals. Nobody wants to read the small print in dreams".

73 from The Voice by the Lake — ar

POUNDING BRASS

GILBERT GRIFFITH VK3CQ
7 CHURCH ST BRIGHT 3741

If you are 'in the know' like me and read your AR each month, you will be getting a little concerned about the future of The Code. Each time I see an article or a letter advocating abolishing Morse, I say to myself, "What can I do?"

This month I have a little idea which, I assure you, is not an April fool joke. We all know the basics behind the digital keyer, and many have now built or bought electronic keyers to make our sending damn near perfect ... well.

The ACCUKEYER, developed by Jim Garrett, WB4BBF, has been around in one form or another since 1973, and was featured in Electronics Australia in March 1978, by Ian Pogson, about the time that Dick Smith started selling the kit. The article from EA was reprinted in LO-KEY in June 1989.

Recently I have received a number of enquiries about the circuit and the kit (not available) and remembered my efforts to obtain all the bits and pieces. I thought it would be a good idea to make the ACCUKEYER a little more available, because even though the Curtis 8044 makes the ACCUKEYER obsolete, it is still the only offering with the automatic letter-spacing feature, something every beginner should use. How to make them more available is to make my own offer to collect unwanted and maybe broken ACCUKEYERS and make them available to budding Morsiacs on a non-profit basis. I am not going to do repairs on your keyers you can do that yourself — but, if you cannot be bothered and you have one sitting in your junk box, you can send it to me and I will then make it available to newcomers to the code. All it will cost you is the postage and you will know that your keyer will be back on the air in good order. I can even keep a list of contributors and recipients, if you like. Do it now, and keep Morse Code alive.

If you, like me, thought that building QRP gear was just a matter of soldering in a few components, then you could not have been more wrong. I am presently putting together a CW transceiver using the Howes kits which I have assembled over the past year or so. You would be excused for thinking that this was just a matter of finding a suitable box and bunging everything in. Ha! I just don't know where to stop at the moment. Even considering just the receiver and transmitter modules, I need an antenna switching circuit and corresponding delay circuitry with extra override controls on the front panel, the metal-

work is already a pain. Now, if I want the extra VFO, it has to go in its own box, inside the main cabinet, with switches to swap VFOs, and more holes in the front for tuning caps and RIT. What about the audio filter? There goes another switch in the front panel. Should I install that 8044 on its little board? Or will the speed control clutter the layout? It would make an ideal source of side-tone though, so I'd better put it in. What about the transmitter — do I want the crystal channels installed? I have a five-position switch for that. Then I can also use either VFO for a transmit frequency source . . . fine . . . no, now the cabinet is too small; I reckon I'll need one about the size of the IC751A. All this for a 'brew rig'!!! Can I fit a battery in there? It will make it handy for portable work; might as well put the paddles in the front as well. Who says home brew isn't fun? I've already drilled about 40,000 holes in the thing. What about a carry handle, antenna tuner, heeelllp!

P.S.: I'll let you know when it's finished . . . 73 Gil **ar**

AMSAT AUSTRALIA

Maurie Hooper VK5EA
11 Richland Road Newton SA 5074

National Co-ordinator
Graham Ratcliff VK5AGR
Information nets
AMSAT Australia
Control: VK5AGR
Amateur check in: 0945 UTC Sunday
Bulletin commences: 1000 UTC
Primary frequency: 3.685 MHz
Secondary frequency: 7.064 MHz
AMSAT SW Pacific
2200 UTC Saturday, 14.282 MHz

Participating stations and listeners are able to obtain basic orbital data including Keplerian elements from the AMSAT Australia net. This information is also included on some WIA Divisional broadcasts.

AMSAT Australia Newsletter and Computer Software

The excellent AMSAT Australia newsletter is published monthly by Graham VK5AGR on behalf of AMSAT Australia and now has over 270 subscribers. Should you also wish to subscribe, send a cheque for $20, payable to AMSAT Australia, addressed as follows.

AMSAT Australia, GPO Box 2141, Adelaide 5001

The newsletter provides the latest news items on all satellite activities and is a "must" for all those seriously interested in amateur satellites. Graham also provides a software service in respect to general satellite programmes made available to him from various sources. To make use of this service, send Graham a blank formatted disk and a nominal donation of $10 per item to AMSAT Australia, together with sufficient funds to cover return postage. To obtain details of the programmes available and other AMSAT Australia services, send a SASE to Graham.

Editorial — Are We Lucky?

You will notice from the following articles that Jas-1b was successfully launched, making seven new amateur satellites this year! On the minus side, Uosat-E (Uosat-Oscar-15) appears to have suffered a major mishap shortly after being placed in orbit — to date, no signals have been heard from it after the first few orbits.

You will no doubt have heard that the mission 36 from Kourou in February suffered total loss shortly after launch. The Microsats/Uosats were on mission 35! Perhaps luck was on our side . .

Another Successful Launch

HR AMSAT news service bulletin Silver Spring, MD February 12, 1990
A new Oscar is born: Fuji-Oscar-20

On Wednesday, February 7, 1990, at 01:33 UTC the National Space Development Agency of Japan (NASDA) launched an H-1 booster from its Tanegashima Space Centre. Aboard this launch vehicle were three payloads: MOS-1B, DEBUT and JAS-1B. MOS-1B is a marine observation satellite and is intended to be used for oceanographic resource studies. DEBUT is an experimental satellite which will have deployable booms and an umbrella-shaped antenna. The third payload was JAS-1B, the JARL follow-on satellite for FO-12. The three satellites were successfully injected into orbit. Separation of DEBUT and JAS-1B from the upper stage of the H-1 occurred over Santiago, Chile at 02:33 UTC February 7. At that moment the 50kg amateur radio satellite which is now known as FUJI-OSCAR-20 was born! The upper stage of the H-1 rocket at that point had successfully completed the final boosting of FO-20 to an apogee of 1700 km. At this altitude, FO-20 would be in a more favourable orbit from the standpoint of not having to experience long solar eclipse periods for the first 150 days after launch. After day 300 and until day 470 after launch, FO-20 will be in a sun-earth orientation such that it will not experience solar eclipse periods. This is expected to provide an excellent power budget for FO-20 users.

On the first orbit over Tokyo at 03:09 UTC, FO-20's CW beacon was heard at 435.795 MHz. The signal was strong and stable. The Doppler shift was estimated to be about 9 KHz. After the first orbit, many QSOs were heard on the Mode JA downlink passband between 435.800 to 435.900 MHz. For example, N9CZA and NK6K worked W6AMW on their first pass on Mode JA. Also, on the second orbit, N5BF made CW contacts on FO-20 on Mode JA to WA4SBC, WB8ELK and KI6QE. On the third orbit, N5BF was able to even push a few packets through the Mode JA transponder using his PSK modem. Later, reports started to pour in about the excellent signals heard from FO-20. W2RS reports that he has worked G4CUO, G6HMS and G8ATE, all on SSB Mode JA on Orbit 38. On the same orbit, HB9XJ worked WA8VXH.

After the initial check-out of all the spacecraft sub-systems of FO-20 are accomplished, JARL will announce the operating schedule. Mode JD and the BBS may be released for service after the initial check-out is completed.

FO-20 Operating Hints

From Peter DB2OS

a) Use shortest TXDELAY as possible (ie 30ms = T3).
b) Do not use MAXFRAME greater than 2.
c) Don't forget to switch the TNC to FULLDUPLEX.
d) Disconnect BEFORE LOS to empty the user list.
e) Make your contact as short as possible to give others a chance. (Do you really have to be connected from AOS until LOS??)
f) Kill all your read messages!
g) Watch 70cm clicks and QRM from your transmitter.
h) Change transmit frequency for doppler (+-2kHz).

Don't forget to switch back to HALF-DUPLEX for terrestrial usage ;-)

Which UPLINK frequency?

HB9AQZ suggests the following system for selecting an uplink frequency:

Take the last letter from your callsign and select:

A . . .G -> 145.850 MHz
H . . M -> 145.870 MHz
N . . . T -> 145.890 MHz
U . . Z -> 145.910 MHz

example: DB2OS —>Uplink on 145.890 MHz
DL1CF —> Uplink on 145.850 MHz

any further ideas? 73 Peter DB2OS

Microsat Object Numbers Correnct

HR AMSAT news service bulletin
Silver Spring, MD February 18, 1990
NORAD/NASA gets the object numbers ordered properly for MICROSATS/UOSATS

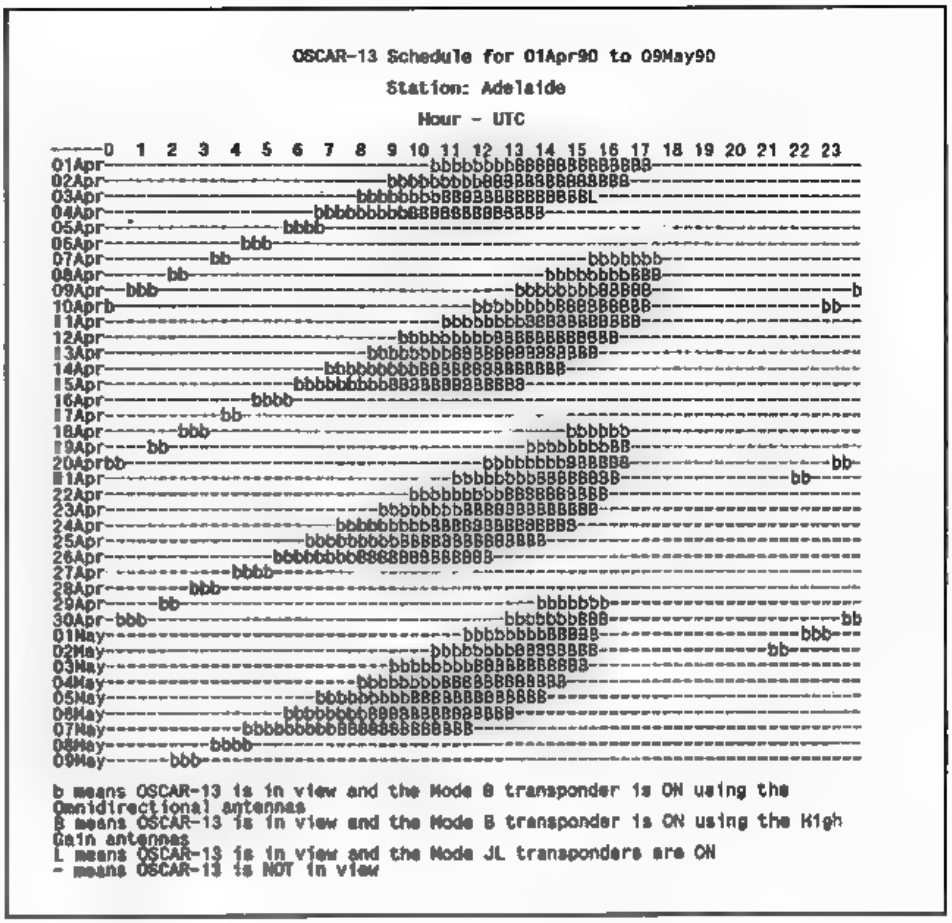
This week, Ray Soifer (W2RS) and Dick Daniels (W4PUJ) confirmed that the North American Air Defence (NORAD) Command and NASA have finally managed to get the object numbers and catalogue numbers for the MICROSATs and UoSATs ordered correctly. After launch, the numbers were assigned based on the order in which the satellites appeared coming over tracking stations. This was definitely not the order in which the satellites were released from the third stage of the ARIANE rocket. In the weeks following launch, a great deal of time and effort were expanded by W2RS, KA9Q and Max White of the Royal Greenwich Observatory figuring out who was who from the elements sets being released by NASA. Eventually, through the efforts of these individuals, the six new amateur satellites were correctly identified from the element sets being published by NASA. However, after AMSAT officials discussed the confusion caused by the random assignment of catalogue numbers with NASA officials, this problem was finally resolved. The following are the corrected object and catalogue numbers which will apply to all MICROSAT/UoSAT element sets after orbit #260:

Satellite Name	Int'l Object Number	Catalogue Number
UO-14	90-05B	20437
UO-15	90-05C	20438
AO-16	90-05D	20439
DO-17	90-05E	20440
WO-18	90-05F	20441
LU-19	90-05G	20442

WO-18 Picture Testing Continues

HR AMSAT news service bulletin
Silver Spring, MD February 18, 1990
WEBERSAT picture testing continues

It is a well-known axiom among photographers that if you want to take a picture of something, you must first point the camera lens in the right direction. However, in outer space it is sometimes impossible to know when your picture-taking satellite will be pointed down to earth. This is what the engineers of WEBERSAT-OSCAR-18 have learned this week from their recent picture-taking efforts. Chris Williams (WA3PSD) of Weber State University reported that of the six pictures taken so far this week, most did not contain anything very interesting to look at. One of the pictures appeared to have been taken of the sun and another appeared to be a picture of deep space. The others seemed to be brighter on one side than the other. Another consideration in the picture-taking process that needs to be taken into account is that the field of view of the CCD camera aboard WO-18 is about 20 deg. Anything outside of that is not seen. So, if the spacecraft ,at the point when the shutter is snapped, is moving or rotating away from the earth's horizon, the earth will be missed. WA3PSD



Satellite Activity for November/December 1989

1. Launches

The following launching announcements have been received"

Int'l No	Satellite	Date	Nation	Period min	Apg km	Prg km	Inc deg
1989-							
091A	COSMOS 2050	Nov 23	USSR	11h49m	39342	603	62.8
092A	COSMOS 2051	Nov 24	USSR	92.8	456	305	64 8
093A	KVANT 2	Nov 26	USSR	91.8	413	344	51.6
094A	MOLNIYA 3-36	Nov 28	USSR	156.0	40600	662	62.5
095A	COSMOS 2052	Nov 30	USSR	89.7	373	175	67.2
096A	GRANAT	Dec 01	USSR	5880	200000	2000	51.6
097A	USA 49	Dec 11	USA				
098A	RADUGA 24	Dec 15	USSR	1475	36551		1.5
099A	PROGRESS M-2	Dec 20	USSR				

2. Returns

During the period 85 objects decayed, including the following satellites.

1967-039A	COSMOS 156	Oct 23
1979-031A	MOLNIYA 1-43	Dec 09
1979-104A	ARIANE LO-1	Nov 27
1980-014A	SMM	Dec 02
1982-121A	COSMOS 1427	Oct 05
1984-104A	COSMOS 1601	Nov 29
1989-067A	COSMOS 1776	Dec 15
1989-066A	PROGRESS M	Dec 01

3. Notes

1989-093A KVANT 2 docked with the MIR manned space station on December 6, 1989. The add-on module KVANT was moved from the central docking port to a lateral port on December 8, 1989.

1989-099A PROGRESS M-2, an automatic cargo craft, was to deliver expendable materials and various cargo to the MIR manned complex.

1989-090A STS 33 landed at Edwards Air Base on November 28, 1989.

Bob Arnold VK3ZBB

wishes to emphasise that there is no evidence of anything wrong with the camera hardware or electronic circuitry aboard WO-18. Except for lack of a good picture of the earth, all the telemetry and data taken so far indicate everything is fine. Since none of the MICROSATs has an active attitude control system to keep it earth pointing, Chris indicates that more pictures will be taken at different latitudes. If you are collecting raw picture data from WO-18, Chris reports that WEBERWARE 1.0 will be released in three weeks. This software will convert the data files into images. Computer requirements are an IBM compatible PC with an EGA or better monitor.

FLASH!

Late-breaking word is that a picture of the earth was successfully taken when WO-18 was over the Himalayas between 0500 and 0600 UTC on February 18, 1990.

73 from Maurie VK5EA ar

REMEMBER

to leave a three second break between overs when using a repeater

SPOTLIGHT ON SWLing

ROBIN L HARWOOD VK7RH
52 CONNAUGHT CRES WEST LAUNCESTON 7250

There has been an addition to this shack, an Atari PC3 computer with an accompanying PCM124 monitor. This fine piece of equipment has taken much of my time over these past weeks, as I familiarise myself with the intricacies of operating it. It has taken me some time to be educated and, as a consequence, I haven't done much listening around It is also my hope to eventually link up my Tono Theta 777 modem to this computer, so I can operate from my desk.

Also, a friend has lent me a Packet TNC to connect up on two metres with the computer but, alas, I haven't mastered that either, and do get increasingly frustrated. There is nothing wrong with it, just that yours truly is rather dense at putting information into the grey matter

When I do at last crack it and make a connection, I will probably jump up and down with excitement.

I can readily appreciate how the addition will materially assist me in my monitoring activities, and already have started storing my loggings into the hard disc. It will also spur me onwards to sending out more frequent reports. After using this computer as a word processor, I won't be needing the old Adler to type out reports and assignments, as previously

When the Atari PC3 is linked up to the Tono 777, I should be better able to keep track of utility services, which are my main monitoring interest, especially with regard to the Intruder Watch.

A number of Australian metropolitan commercial outlets departed medium wave in February to populate FM 3KZ, 5KA, 3GL have moved there with new callsigns, with 4BK and 3AK to go and shortly join them. The channels are temporarily vacant, until they are required by either the RPH or PB stations, so those with loop or other MW antennas should, theoretically, be able to hear other stations there now

On January 23, Radio New Zealand International came on-air with its new 100kW sender. It is located near Lake Taupo and, although it is not beaming to Australia, does provide excellent signals and audio. It is much more pleasant to receive now that the antique 7 5kW senders have been pensioned off

The station no longer relays the National Programme, but concentrates mainly on Pacific/Melanesian dialects plus English The best channel I have found is 17680 kHz from 0300 to 0900 UTC

Several international broadcasters have had to cut back programming due to budgetary restraints The VOA is deleting Greek, Turkish, Slovenian and Laotian from the first of this month, with Uzbek and Shona from June 1 Religious broadcaster, Radio Veritas International in Manilla has deleted its English releases

The proposed VOA/RFE/Kol Israel facility in the Negev Desert of Israel is now in doubt, due to environmental and navigational concerns. As well, the changed political nature within eastern Europe and the USSR means that the facility is no longer a priority to either RFE or VOA. If the Americans do pull out, it would be left to the Israelis to pursue independently

Radio Korea in Seoul has reached agreement with Radio Canada International to share each other's facilities, and is due to commence on April 2. RCI will be heard via R Korea from 1300 to 1325 UTC in Chinese on 6150, 1330 till 1400 in Japanese on 6095 and 1430 to 1455 in Chinese on 9700. Seoul, via the Sackville transmitters of RCI, will be heard on 11715, presumably in Spanish from 1000 to 1030 UTC — 1030 to 1100 in English On 6145 and 9645 kHz, Korean programmes will be aired from 1100 to 1130 to North America.

Well, that is all the news for this month Until next time, the very best of 73 and good monitoring! ar

ALARA

JOY COLLIS VK2EBX
PO BOX 22 YEOVAL 2868

Women In Wireless

By Olive J Rockner VE7ERA
Condensed from the Canadian Amateur Radio Magazine

As a former seagoing brasspounder it saddened me to learn that CW is to be phased out commercially by 1991. No longer the friendly chatter of Morse around the world as ships on vast oceans reach out to other ships or to coast stations on distant shores I would like to acquaint the reader with a relatively little-known fact — mention wireless operator to the average person and an image comes to mind of a lone man hunched over a key How many are aware of the part women have played in the annals of seagoing sparks, in particular, Canadian women? Records indicate the first young woman to serve at sea as a wireless operator was American, a Miss Graynella Packer, in 1910. Miss Packer remained only a few months, but by the end of the '30s at least 13 other young ladies had operated on vessels along the Atlantic and Pacific coasts and on the Great Lakes.

In 1940, the Merchant Marine began recruiting operators in Canada. Twenty-year-old Fern Blodgett had dreamed to someday become a sailor Working days as a stenographer, she attended wireless night classes, gaining her commercial licence 18 months later only to discover there were no positions open to women. A few weeks later, however, Fern's former principal phoned and asked if she was still serious. "Yes" was the answer Port authorities at Montreal were surprised to find that F Blodgett was a YL, but checked with the captain of the Norwegian cargo ship "Mosdale" to learn if a woman was acceptable Captain Sunde was desperate and agreed Fern proved to be a capable operator Constant storms were the ship's lot and Fern witnessed many horrors of torpedoing and their attendant tragedies

In 1942, Fern married Captain Sunde, and their honeymoon was spent at sea, in convoy Mosdale was a lucky ship, she made 98 Atlantic crossings, of which Fern was aboard for 78 Fern retired from the sea after war's end to make her home in Norway A book of her

adventures, "Lucky Mosdale", became a best-seller in Norway

The second east Canadian woman to take up the sea was Esther Crichton of Halifax. She sailed aboard M/S "Narvik" in the Pacific area during the latter war years, and retired in early 1947

The first west Canadian girl to receive her licence was Ina Waller of Kimberley BC. She did not go to sea. She served in the Marine Room at VAI, the Pt Grey Wireless Station, and as an interceptor operator there and at Victoria. A number of others earned their commercial tickets during the war years and were employed mostly as interceptor operators at various DOT stations. From Western Canada there were three who sailed in wartime Ola McLean of Vancouver and Alice House of Port Coquitlam graduated from Sprott Shaw School of Radio in 1944, determined to ship out, and succeeded later that year in an uneventful crossing of the Pacific. A brief report appeared that Ola and Alice had arrived safely in an Australian port aboard an Allied (not Canadian) tanker after a voyage during which they were treated royally. The article stated that the two were prevented from signing on a Canadian ship by marine regulations in Canada.

Alice later served on the Norwegian tanker "Karsten Wang", and in 1947 married Captain Olaf Hansen who has been second officer of the same Norwegian tanker on which she had made her first voyage

Ola McLean remained at sea for a number of years, her voyages taking her to most of the ports of the world.The third western YL with wartime experience was Rosemary Byrom of Victoria, who joined her first Norwegian ship in San Francisco and remained aboard for a year. Service on three more tankers followed, one of which sailed in the last convoy to cross the Atlantic before VE day Rosemary retired about 1947

After VJ day, women interceptor operators were released from government service and Anna Ozol secured a position aboard a Norwegian vessel and achieved the doubtful distinction of being one of the few women who had to send out an SOS, happily the vessel was able to make port without aid.

On leave in February 1947, Anna brought word a Norwegian ship in San Francisco needed an operator Within days, Elizabeth King was fulfilling her longtime wish to ship out. Elizabeth joined her first vessel and sailed across the Pacific to the Philippines, Orient and Australia, remaining aboard just over a year, and after a lengthy holiday ashore, shipped out again in another vessel also sailing the Pacific routes Elizabeth served until early in 1951 when she left the sea for good.

After Elizabeth, Norma Gomez and myself quickly followed. Norma was assigned to a coastal vessel with primitive conditions and she retired six months later

I was more fortunate, replacing Esther Crichton, and served four years, covering much of the world.

Merilyn Wright WA4NR

Sisters Maxine Reams N6GGR (left) and Gerry Swanson KD7RA

The only other Canadian girl who went to sea in those years was Lylie Smith. She shipped out in 1946. Prior to that she had been the first girl radio operator hired by the Hudson's Bay Fur Trade Co for its northern posts. Probably the longest at sea of any of the Canadian YLs, Lylie spent five years on the Far East routes, and another five years sailing between the US, Europe and South America.

By the late '40s and early '50s, Norwegian girls were taking over more of the positions on their country's ships. The few Canadian YLs settled ashore and no others followed in their wake. Until 1970, when Dallas Bradshaw from Victoria BC went to England for training, and became the first woman operator to sail aboard a British ship

Predominantly, it has been Scandinavian countries which have accepted women operators, mainly Norway and Sweden, and other countries, Denmark, Finland, Germany, Russia and Great Britain. The US started is, although its numbers have not been as great

as Scandinavia. American girls have continued to serve since the latter war years in their merchant marine, Coast Guard, and on Army transport and hospital ships.

A number of YL professionals are also amateurs, with callsigns many will recognise. Elizabeth VE7YL also had the callsigns EP2ELA and YB0ADT. Kirsti VK9NL, and Kari VR6KY. Others, Sylvia LA10GA, Mikaela DK5EJ/OH2SG, Esther W6BDE and Lota AC7V.

Ship's operators may disappear, but Morse will be around for a long, long time, of that I am convinced. For many of us it is, and always will be, mysterious music that spans the globe — our other language.

Bits and Pieces

Heather VK2HD was pleased to have the opportunity of meeting Lloyd and Iris Colvin when they took time off from being rare DX stations in remote parts of the world to visit Sydney earlier in the year.

Reminder: Thelma Souper (WARO) Contest — April 7 and 8, 1990 0700 to 1000 UTC each day. (Rules March AR).

We certainly have Iris Colvin to thank for activating so many new YL countries, but other YLs continue to appear on the bands from remote places. One worked recently (unfortunately not by me) was Patti N3CRH/TJ (Cameroon). Makes obtaining YL-DXCC much easier than it used to be.

It has been very pleasant recently to hear some "new voices" on the Monday night ALARA Net, and the numbers joining us on 80 metres are increasing, in spite of the band being a bit noisy at times. VK6 members have special problems in the summer, which make it very difficult for them to join the official net at that time of the year.

From the "War Widows" magazine

Oh, give me your pity, I'm on a committee
Which means that from morning to night
We attend, and amend, and contend and defend
Without a conclusion in sight.
We confer and concur, we defer and demur
And reiterate all or our thoughts
We revise the agenda with frequent addenda
And consider a load of reports
We compose and propose, we suppose and oppose
And the points of procedure are fun!
But though various notions are brought up as motions
There's terribly little gets done
We resolve and absolve, but we never dissolve
Since it's out of the question for us
What a shattering pity to end our committee
Where else could we make such a fuss?

Author unknown

That's it for this month. 33/73. **ar**

REPEATER LINK

Will McGhie VK6UU
21 Waterloo Cres Lesmurdie 6076

Thank you to all those who wrote, telephoned or contacted me via Packet radio. The response was not in the hundreds, but it was pleasing to hear that a repeater column can contribute to better repeater management.

Desensing

If your repeater is running with no problems and has lots of technical input from experts, then skip over this paragraph. If we could go back in time and redesign the off-set on two metres for repeaters, I would not choose 600KHz. It is just too close for high performance on a consistent basis. Many amateur repeaters on two metres suffer at some time from desensing. However, it is impossible to change now. Does your repeater suffer from desensing? Maybe you think it does not but, in fact, it does — how do you tell? The simplest way you can find out is when you next visit the site, try the following test. Ask an amateur to transmit a signal that produces a slightly noisy signal into the repeater's receiver as monitored on the repeater's loudspeaker. Now turn the repeater's transmitter off and see if the noise as received from the weak signal reduces. If it has, then your repeater is suffering from desensing. Maybe you are not going up to the site for a while, so try this second method of finding out if your repeater system is desensing. Find an amateur who can vary his power output down to almost zero. While you monitor the repeater's output, ask the other amateur to slowly reduce the power output of his/her transmitter, on the repeater's input, down to zero. If the signal you are receiving on the repeater's output slowly becomes noisy and turns the repeater's transmitter off once only without the repeater transmitter keying on and off in a regular fashion, then your repeater does not suffer from desensing. A regular on-off cycling of the repeater's transmitter means your repeater does suffer from desensing. What to do about it is another matter, but at least you will know if your repeater is as sensitive as it can be.

Autopatch

Autopatch is similar to phonepatch, but differs in two important ways. Firstly autopatch is a phone connection via your local repeater, and secondly the amateur signal can be mobile. These differences may seem slight, but they make autopatch illegal. It may be that the first difference, connection via your local repeater, is no longer a problem. Making a phone call via a repeater implies automatic dialling and, until now, this was not allowed. If what I read lately is true, automatic dialling is now permitted. The second difference is, as I understand it, the only remaining reason for autopatch being illegal. Telecom has the monopoly on mobile phones in Australia and, as a consequence, autopatch is not allowed. I may be wrong in my assumptions of the situations, so if you know better, please let me know. It often comes as a surprise how the commercial world affects the world of amateur radio. To think that autopatch could in any way compete with Telecom is, of course, ridiculous, but it may be the foot in the door for other organisations to connect radio systems to the telephone. This may change as an investigation into Telecom's monopoly of the mobile phone service is under way.

Just maybe this outcome will bring amateur in Australia a lot closer to autopatch. If my assumption about it being illegal to operate from a mobile situation into the phone system is correct, then phonepatch cannot operate to a mobile HF radio. As you can read, I have many unanswered questions so, please, if you can explain the situation, contact me by writing or phoning on (09) 291 7165 or Packet radio VK6UU at VK6BBS. **ar**

Stolen Equipment

Stolen from Andrews Communications Stand at the Gosford Field Day, one standard C520 2m/70cm handheld transceiver Serial No F140829. Contact Andrews Communication Systems PO Box 33 Kensington 2033 PH (02) 349 5792

Stolen from E Radclyffe VK1TR from Phillip College car park on 6th Feb ICOM IC-22 Serial No 1246F. Contains crystals for channels 40 and 50 and repeaters 146.9/146.3, 146.95/146.35. The dial globe is obviously not original. The power wires have no plug and the squelch circuit is intermittent. Contact VK1TR QTHR.

Stolen from vehicle of G Howard VK3XD at Diamond Creek 8th February 1989 one IC-22 VHF FM Transceiver Serial No 10918. Contact Greensborough police or VK3XD QTHR. **ar**

DIVISIONAL NOTES

FORWARD BIAS

PHIL CLARK VK1PC

Hi, welcome to Forward Bias again

Well, things have been quiet in VK1 for a while, but now there is some news to report.

As you all probably know by now, we have good stocks of the smart new log books in both horizontal and vertical format, and they are very attractively priced. Have a look in the bookshop at each meeting and see what is available. If what you want is not there, ask, and we will see if we can get it.

There has been quite a stir over the charges for repeater sites under the cost recovery by some Government departments. In the ACT, the sites at Mt Majura and Mt Ginini, where our repeaters and beacons are located, are owned by the Civil Aviation Authority, and the first indication of the cost for these sites well exceeded our ENTIRE annual budget! We contacted the department and, as a result, it reviewed the charges because of the community support and the emergency communications provided by the amateur repeaters without cost to ANY users. The amateur repeaters are provided by the division's volunteers as a service to the community and any amateurs without charge. It is worth pointing out here that the repeaters are designated to be used in emergencies by WICEN and have been included in the New South Wales Government-approved disaster plan for the Queanbeyan and Molonglo rivers. The Mt Ginini site is crucial because it has a power supply independent of the power grid and is not as likely to be affected by power failure in the event of a disaster in the local area. As I said before, the department did review its charges and gave substantial reductions in the fees; however, even the reduced amount is a large part of our annual budget, and will be a serious strain on our limited resources. Naturally, we are in contact with the department with a view to maintaining the facility on Mt Ginini. In the next report I hope to have more news about this.

Classes for the NAOCP exam have started in February, and the attendance at these has been very good! We are pleased to see the interest in amateur radio as shown by the enrolments for these, and hope those attending will become new members of the division.

On the matter of exams, the last amateur exam conducted in Canberra by the Department of Transport and Communications was held in February. Future amateur exams in Canberra will be conducted by the Wireless Institute. The committee has decided initially that these will be held at monthly intervals, depending on applicants. At the time of writing, it was hoped that the first exam to be conducted by the Institute would be held in May, but we will keep you informed of developments in the weekly broadcasts.

Recently, we have been pleased to welcome quite a few new members to the VK1 division. To welcome new members to the division in future, they will be announced on the news broadcasts. In line with the policy of announcing new members, the following were accepted as members of the ACT division at the February meeting. We welcome Iris Weigarten VK1NXV, Doron Arad VK1AB, and Rob Apathy VK1KRA to the VK1 division.

A warm welcome is extended to all visitors and prospective new members at our monthly meetings.

A contingent from VK1 joined others from Wagga, Goulburn and the surrounding area for the bus trip to the Gosford field day organised by the Goulburn club. As usual, the organisation and facilities provided were of the expected high standard and were much appreciated by all who availed themselves of the opportunity to go to Gosford.

The division has been active in providing those services that members let us know that they want. One of the more popular services is the purchase of certain equipment, when we can pass on substantial savings by making bulk buys. In the past, the division has been able to provide items such as headsets, transformers, coax and other items at very reasonable prices to members. We are making every effort to continue this service and, at the time of writing, are looking at the possibility of purchasing coax, power transistors and good quality BNC and N-type connectors.

As most of you are probably now aware, the latest ruling by the Department of Transport and Communications resulting in the strict enforcement of regulations in regard to the advertising of items on the weekly broadcast means we can no longer inform members of goods the division has for sale — including books — through this medium. This has also imposed restrictions on the information that can be given out about personal items for sale. The committee is taking steps to try to keep members informed of "for sale" and "wanted" items, both from the division and from members.

The division is also planning to restart the popular social activity of fox-hunts. Arrangements for these will be announced on the regular weekly broadcasts as details are finalised.

The annual general meeting took place on February 26. The following were elected to office:

President: Ted Pearce	VK1AOP
Vice President: Phil Clark	VK1PC
Vice President: Carl Makin	VK1KCM
Treasurer: Ken Ray	VK1KEN
Secretary: Jan Burrel	VK1BR
Fed Cr: George Brzostowski	VK1GB
Committee Members	
Neil Pickford	VK1KNP
Darryl Fallow	VK1DF
Marion Leiba	VK1VNG
Paul Tams	VK2CJ

We wish the new committee success in 1990.

VK2 NOTES

TIM MILLS VK2ZTM

Annual General Meeting

Members of the NSW Division are advised that the AGM of the Division will be held on Saturday the 28th April 1990 at 2pm at Amateur Radio House, 109 Wigram Street, Parramatta. The agenda, reports and financial statements together with any other material for the meeting is included as an insert to this issue of "Amateur Radio".

Family and non "AR" receiving members will receive a separate posting. Should you not receive this insert, please contact the office. The insert will also have your membership card for the 1990/91 year. Look carefully for it, as last year some 60 members did not find it before throwing out the report.

Contact With The Division

The Divisional office may be contacted by mail to PO Box 1066, Parramatta NSW 2124: FAX, 24 hours a day on 02 633 1525. Phone message taking answering machine is across the line. To fit in with the office arrangements, the phone is currently being manned between 12 noon and 1pm Monday to Friday and 7 to 9pm Wednesday. Office and library open 11am to 2pm Monday to Friday and 7 to 9pm Wednesday.

Silent Key

It is with regret that we have to report the passing on 1st March 1990 of Keith Howard VK2AKX. Keith founded the Westlakes Amateur Radio Club at Teralba, a Newcastle suburb, in the early 1960's. He was a Life Member of the Division. *(See Obituary on P54 Ed.)*

VK2BWI Slow Morse

We had a recent note from Ross, VK2BRC, the Co-ordinator of the Division's 80 metre slow morse session. It has been decided for the remainder of this year to commence the session at 8pm local time, and not adjust for daylight saving. The frequency is 3550 kHz. The present sun spot cycle is placing a high absorption on the 80 metre band. The IPS forecast for this month shows the ideal working frequency for the VK2WI morning broad-

cast as higher than 11 MHz. We will not be reintroducing the morning 80 metre transmission at the moment, and will continue to rely on the 40 and 30 metre transmissions — 7146 and 10125 kHz. We still seek more country clubs to consider relaying the VK2WI broadcasts to their local VHF or UHF repeaters.

Exams

Now that the exams are to be conducted by the Amateur Radio Service, various people have been approved by the Department to provide them. The Division is one of these sources, and at the time these notes were written, the exact timetable was still being worked out. It is expected that a quarterly interval will be adopted with exams at the weekend. The first exam conducted by the Division is expected in May. Listen to the broadcast, or contact the office for further details. Would others conducting exams please advise the office, so that we have the details and can advise inquirers accordingly.

QSL Bureau

Recent increases in postal charges have forced the VK2 Bureau to increase some handling charges. You should also note when sending in your OUTWARD cards that the packet should not be greater than 200 mm thick or it becomes an expensive parcel. Contact the Bureau for new rate details.

WICEN (NSW) Inc

Some new information leaflets have been printed and distributed to some clubs and groups. Check with them. Membership and general WICEN inquiries should be directed to PO Box 123 St Leonards NSW 2065.

Urunga Convention

The 42nd Urunga Convention will be held over the Easter Weekend — 14/15th April. Information from telephone (066) 52 3177; 55 115 or 53 2463. Mark up the calendar for the June holiday weekend at Port Macquarie, for the Oxley Region field day. Details from PO Box 712 Port Macquarie 2444. Phone contact (065) 83 1311. The Central Coast ARC may be conducting the 1991 field day on a Saturday, as it is unlikely that the present site will be available on a Sunday.

New Members

A warm welcome is extended to the following who became members of the NSW Division during February:

I M Boswell	Assoc	Gladesville
P R Browne	VK2XQK	Speers Point
D W Chaffey	VK2NBC	Chester Hill
M P Covi	VK2KMP	Hamilton
R E Goodwin	Assoc	Wombarra
A J Hargreaves	VK2MGL	North Lambton
K G Harriman	VK2AFH	Meerschumvale
G Herodes	VK2XQU	Moorebank
P G King	VK2GPK	Morisset
F W Lawler	VK2KMU	Warners Bay
K Tahara	VK2FCA	Sydney
H Wagner	VK2CCW	Kings Langley

Time/Date 11.00 am. Sunday 22nd April 1990

Venue- 59 Westbrook Ave, Wahroonga NSW 2066.

Members, non-members and friends interested in Packet Radio are cordially invited to attend the AGM of the Australian Amateur Packet Radio Association.

It will be held irrespective of weather conditions. Luncheon will be provided at a cost of $5.00 per head. BYO "beverages" if required. We need firm numbers for catering, so please notify by post to the above address if you will want to eat, and enclose payment. **The last date for acceptance must be 17th April, preferably before Easter.**

A warning is issued that absentee packet operators are at risk of being appointed as officer bearers!

de John VK2CFJ, Hon Sec AAPRA

VK3 NOTES

JIM LINTON VK3PC

WIA Examinations Service

Applications for the examinations being conducted by the WIA throughout Victoria next month close on April 30. Intending candidates have only a short time to make an application to contest the examination being held on the night of the third Tuesday in May. Applications must be made on a prescribed form available from examination supervisors who are part of the WIA Examinations Service. To find out the contact name, phone number and postal address of your nearest exam supervisor, ring the WIA Victorian Division office on either Tuesdays or Thursdays between 9am and 4pm. It is planned to have examinations in May, August, November and February each year. Applications will close on the last day of the preceding month, and must be accompanied by the examination fee(s).

Inwards QSL Bureau

All correspondence for the Inwards QSL Bureau, including registrations or changes to callsigns and addresses, should be sent to the Divisional Office. We cannot accept changes over the telephone; they must be in writing from the person concerned.

The Bureau is using a computer database which holds all of the user registrations and their chosen distribution points. Information sheets on how the Inwards and Outwards QSL Bureaux work are available free on request.

Sunday Broadcast

The weekly news and information broadcast through VK3BWI on Sundays has a new outlet -- the Otways two-metre repeater VK3ROW. Thanks to the efforts of the Geelong Amateur Radio Club, the broadcast is now automatically relayed through this repeater. Plans are still moving ahead to have the broadcast relayed through the Mt Wombat two-metre repeater VK3RGV to better serve north-central Victoria.

Clubs, zones, groups and other contributors to the broadcast, please note the deadline for written news items to reach the Divisional Office is 10am on Thursday each week.

5/8 WAVE

JENNIFER WARRINGTON VK5ANW

5WI - The Saga Continues

Here, as promised, is the information provided by Reg VK5RR. Reg writes . . . "The first VK5 News on Sunday mornings (post war) was on 26.1.47, using my own callsign. This continued weekly, up to and including 20.4.47. The frequency in use was 7081kHz for the first two Sundays and then changed to 7195kHz thereafter. Against each entry was the note "See Special Log Book" in which "callbacks" were recorded. The last such entry in my Log Book was on 20.4.47, so presumably the official 5WI call was used. I carried on for about a year when, due to business reasons, I think, I was obliged to relinquish the position (a letter of thanks from 'Doc Barbier VK5MD confirms that he retired on 25.3.48) . . . I think the 80m broadcast you refer to was more in the nature of a Morse practice session, as I remember doing this in the evenings once a week.

Hal Austin took over from me until 1954, and then it was taken over by Charlie Othen VK5ON."

Thanks, Reg, for taking the trouble to write and fill in those gaps.

From a very early Slow Morse operator to a very new one. Nigel Hanwell VK5KAG (although I suspect that he has upgraded by now) is the latest volunteer on the Slow Morse panel. Nigel joins Trevor VK5BWF, Jack VK5AJK, Wayne VK5AC who is also the co-ordinator, Brenton VK5AQ, Ron VK5AAC and Emlyn VK5AEJ (who only came to help out for a couple of weeks — 13 years ago!). If you'd like to help out, I'm sure Wayne would be pleased to hear from you.

Diary Dates

Don't forget the AGM on Tuesday April 24 at 7 45pm. It would be nice to see some new 'blood' on Council. I shall be retiring after 10 years. It certainly isn't a record, but I think it's long enough' ar

VK6 NOTES

JOHN HOWLETT VK6ATA

AGM

Make sure you have your say on the 17th of April. After all you have paid for the right and it's no good complaining later. Nominations for council are:

Atkinson, Harry	VK6WZ
Bastin, Christine	VK6ZLZ
Harlock, John	VK6GU
Hedland-Thomas, Bruce	VK6OO
Howlett, John	VK6ATA
Penfold, Neil	VK6NE
Thurston, Glen	VK6ZGT
Wallace, Dave	VK6IW

The nominations were ruled by council as incorrect, and another was withdrawn before the closing date.

Exams

The WIA and DOTC are working towards accreditation for special examinations in morse, theory and regulations. Council will keep you up-to-date as agreements are made.

Congratulations to the Peel amateur radio group for the fine social day out. The 60-70 people who turned up on Saturday 17th February enjoyed themselves, and some stayed overnight at Bunbury and made a weekend out of it. Thanks to Alex and XYL who made us welcome and hope we were all suitably well behaved to be invited back again! ar

CLUB CORNER

Radio Amateurs Old Timers Club Meeting (Qld)

The next meeting of the Radio Amateurs Old Timers Club will be held at the Coorparoo RSL Club, 45 Holdsworth St, Coorparoo, Brisbane on April 29, 1990. All old timers having been licensed over 25 years or nearing 25 years are more than welcome to come along to the luncheon. For further information and registration, phone Bill Bentson, VK4QF, (07) 870 8785 or Cress Everdell, VK4ZAO, (07) 208 4535. Apologies would be appreciated. This will be the 11th biennial meeting.

Bill Bentson VK4QF

Healesville Amateur Radio Group

The Healesville district and the Upper Yarra Valley has a relatively new club actively promoting the hobby. The Healesville Amateur Radio Group (HARG), while small in number compared with the larger metropolitan clubs, has all the elements to ensure its long-term success. Enthusiastic members are taking part in field-day activities and planning is well advanced for them to active a local scout callsign during this year's Jamboree on the Air.

After achieving publicity in local newspapers and other outlets, the club started classes which have seen a number of people obtain their Novice licence, and some are going on to upgrade. HARG is supervising examinations set by the WIA Victorian Division Examinations Service and attracting candidates from the Upper Yarra valley and outer eastern Melbourne suburbs.

It has weekly meetings on Wednesday nights at the Postal Institute building behind the Healesville telephone exchange. For further information, contact the HARG President, Graeme Tremellen VK3TGP (059) 62 6098.

South East Radio Group Inc

South East Radio Group Inc is holding its annual convention over the Queen's Birthday long weekend in June this year.

The latest state-of-the-art communications equipment will be on display and no doubt there will be some hard-to-beat specials on offer. Those of you who don't fancy the most recent technology will find much pre-loved gear available.

Of course, you can always spend some time just relaxing and catching up on the events of the past year with your friends. You can do this in comfort, as there is ample space available, with tea and coffee facilities.

South East Radio Group Inc will again host the Australian Fox Hunting Championships. Participants from last year will attest to the fact that the competition was fast and furious. It will be even better this year, with the addition of a 1296 MHz Hunt. Other events will, of course, be programmed to ensure that a wide range of tastes is catered for.

HARG Vice President, Lyn Eddy VK3DKE (left) and President, Graeme Tremellen, VK3TGP, show WIA Div. President Jim Linton VK3PC, seated, the club's station during the recent visit

You are urged to come and spend an enjoyable weekend with us on the June 9 and 10, 1990 Anyone who has been before will tell you how worthwhile it will be

Should you decide to attend, accommodation will need to be organised as quickly as possible as Mount Gambier plays host to many functions at this time. Further information and registration forms can be obtained by writing to the Convention Co-ordinator, PO Box 1103, Mt Gambier, 5290

See you there. ar

QSLs FROM THE WIA COLLECTION (23)

KEN MATCHETT VK3TL HON CURATOR WIA QSL COLLECTION
PO BOX 1 SEVILLE VIC 3139

"Island in the Sun"

JM-2PZ

This QSL from Jamaica is one of the rarest in the WIA QSL collection. Dated December 1926, it resulted from a SWL report sent by Mr L G (Len) Simmons. On the front of the card, the Jamaican reports that "you are my first 'A' to report my signals. You are quite correct, was working Z4AC and Z2AE at the time you heard me. One hundred and twenty Watts input". It will be remembered from earlier articles that the prefixes as we now know them really started in 1927 Before this, there was an attempt to systematise callsigns by using letters which were in many cases abbreviations of the name of the country of origin. Thus the 'A' and the 'Z' calls referred to above stood for Australia and New Zealand respectively. Similarly, JM was used by Jamaican stations. On the bottom of the Jamaican QSL is printed. "Armstrong tuned plate tuned grid — one UV 203 A". The Armstrong oscillator is very similar to the well-known Hartley circuit, but instead of having the inductance between plate and cathode (as part of the tapped resonant tank inductor) the Armstrong oscillator had a separate plate inductance. The Armstrong circuit was the circuit that appeared in the first-published paper on regenerative reception (Proc IRE Sept 1915). It was the advent of regeneration, of course, that changed the nature of radio transmission and reception almost overnight.

This revolution in the use of the audion valve brought about a degree of both selectivity and sensitivity previously undreamt of. Amateurs the world over owe a great debt of gratitude to its inventor, Edwin H Armstrong, who developed the idea whilst still an undergraduate at Columbia University between the years 1913-1915.

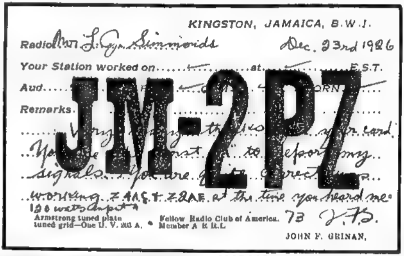
The transmitting valve mentioned, viz UV 203A, was a general-purpose triode which was useful up to 10MHz. It took about 1000 Volts on the plate with a plate current of about 150 mA. The 'UV' was a valve base code indication.

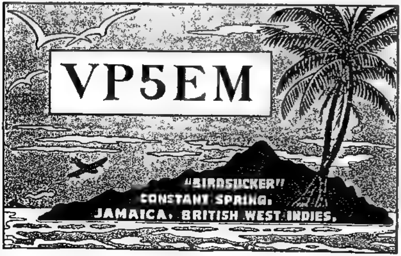
At the time of the QSO, Len was living at Belgrave, Vic He was later to become VK3LV and a 'silent key' in 1987

VP5EM

The recipient of this QSL was Bob Grundy VK5BG (he became a 'silent key' in 1988) Bob received his licence in 1937 and operated from Crystal Brook, SA. He was the radio operator with the Leichhardt Search Expedition of 1938. Bob's equipment is shown in "The Murray Bridge Story" by Lloyd Butler in 'AR' July, 1988

In the latter part of the 1920s, the JM prefix was replaced by VP5 from the "British Colonies and Protectorates" prefix block allocation VPA-VSZ.



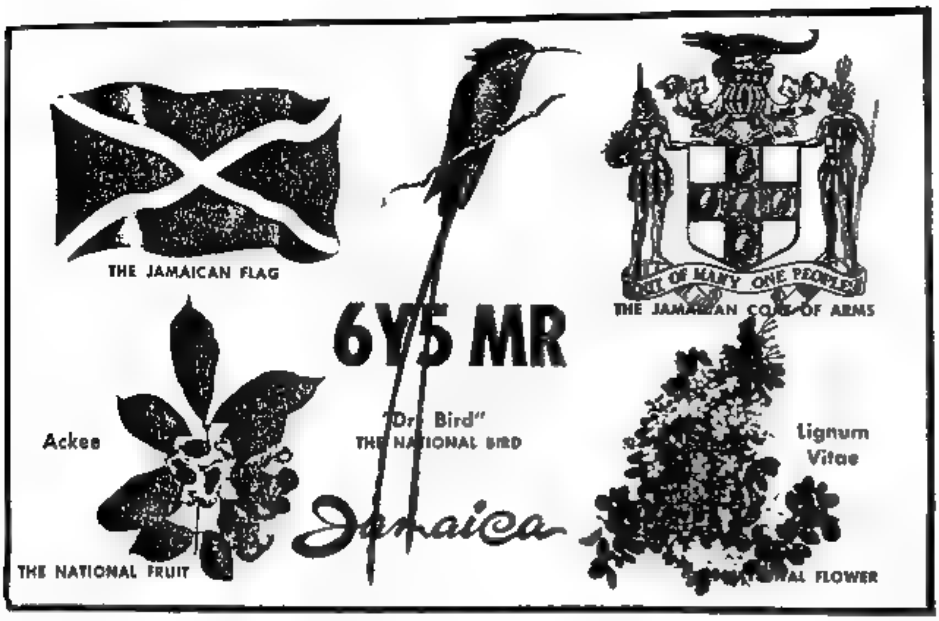


6Y5MR

Jamaica is the largest of the Commonwealth countries in the West Indies, and the third-largest island in the Caribbean With its area of a little over 11,000 sq km, it is about one sixth the size of Tasmania.

Discovered by Christopher Columbus in May 1494 on his second voyage, the island was at first called Sant Jago, but the Indian name, Jamaica (derived from Xaymaca), survived The name means "land of water" and refers to the numerous rivers that flow down from the island's central mountains

Although bauxite and tourism are important revenue producers, sugar remains the main export, as it was in the days of slave labour on the sugar plantations Sugar and its famous derivative, rum, have formed the backbone of the country's economy The rich full-blooded Jamaican rum was once the main means of exchange during the slave trade, and was a



naval ration (called 'grog') from the 18th century to as late as 1970.

Three years before his death in 1506, Columbus again visited Jamaica (on his fourth and last voyage). His son Diego became the colony's first governor. In 1596, the British attacked and sacked the island's capital city Spanish Town, but, despite this, Jamaica remained in Spanish hands until 1655. A few years later, the British occupation was formally recognised by the Treaty of Madrid. This was followed by a large influx of new settlers, many of whom were undesirables. In fact, Jamaica became a refuge for pirates and buccaneers, amongst whom was the famous (or infamous) Henry Morgan. Due to his exploits against the Spaniards, he was later to be rewarded with a knighthood and the governorship of the young colony.

When Jamaica was granted independence in 1962, after being under British rule for 300 years, the new prefix 6Y5 replaced VP5, which to that time had been shared with Jamaica by the Cayman Islands and the Turks and Caicos Islands

The 6Y5 QSL card from Kingston, the island's present-day capital, shows the national flag, fruit, bird, flower and coat of arms. The flag consists of a gold cross (representing the value of natural wealth) together with the colours green (symbol of hope and agriculture) and black (symbol of the past and the hardships facing the country)

The QSL card was received by Roy Jonasson (now an 'SK') VK4NE who held several calls between 1928 and 1989. It is one of many QSLs kindly donated to the WIA by his son, Neil

Thanks

The Wireless Institute of Australia would like to express its thanks to the following for their contribution of QSL cards towards the Collection:

(Supplementary List)

John,	VK3ZA
Roy,	VK2TR (ex VK9AU)
Frank,	VK2QL
Roland,	VK2GAL
Lindsay,	VK5GZ
Neville,	VK7NC
Jim,	VL6RU
"Snow",	VK3MR

Also to the friends and families of the following 'silent keys' (Supplementary List)

Jim Porter,	VK2AXP
Jack de Cure,	VK5KO

The 1990 DX QSL Contributors' Ladder:

Frank,	VK2QL	161 points
Jim,	VK9NS	158 points
Ray,	VK3RF	24 points
Bruce,	VK3BM	13 points
Barry,	VK5BS	10 points

Scoring QSLs Received

Frank, 2QL. Prefix TZ2, special calls: OH0MAS, ZM0ZOU, KY6ITU, KS7ITU, KS9ITU, KN6ITU, KG6ITU, KI4ITU, KG2ITU, KJ2ITU

Lindsay, G5Z. Prefix EW3, special calls: VK2RAS/5, VK2BWI

The task of adding to the WIA collection of prefixes, and especially allocated callsigns, is becoming increasingly difficult (even for our best DX-ers) but why not give it a go? Please write for a "Wanted Prefixes" list.

Thanks to all contributors. Keep up the good work. If you would like to play a part in building up the WIA QSL collection, and to save something for the future, would you please send a half-dozen (more if you can spare them) QSLs which you feel would really help the collection along. All cards are appreciated, but we especially need commemorative QSLs, special event station QSLs, specially assigned QSLs (e.g. VK4RAN) prewar QSLs, unusual prefixes, rare DX and pictorial QSL of not-so-common countries. Could you help? Send to PO Box 1, Seville, 3139, or phone (059) 64 3721 for card pick-up or consignment arrangements for larger quantities of cards Thanks **ar**

INTRUDER WATCH

GORDON LOVEDAY VK4KAL FEDERAL INTRUDER WATCH CO-ORDINATOR
AVIEMORE RUBYVALE 4702

This month, I thought readers may be interested in some doings from Region 1 John VK4QA has been spending some time in the Netherlands and other places.

"It is interesting to read about Region 1. Veron is a consistent contributor to IARUMS, as are the following: Fed Rep of Germany, Finland, Sweden, the RSGB has been revitalised with a new co-ord in 1989, G5XB." Also a Report of the IARUMS Co-ordinator, covering '87/'88 and '89 "Gradually, the "picture of intruders" on several amateur bands is changing. In particular, the 7MHz band has become much more usable by the disappearance of practically all broadcasting stations. The Chinese and Albanian BC stations went QRT. Occasionally, new BC stations came up, but went off air again after some time. In these cases, IARUMS has been very active with complaints and requests to shut down the transmissions. The problem of non-amateur RTTY transmissions is growing steadily Many of these occupy amateur frequencies for many hours or whole days, with usually only idling signals A lot of time has been spent trying to identify these RTTY signals. Knowledge of the origin of these signals is growing Means to attain this take bearings and measure shift/baud rate, where and when suitable equipment is available It is clear that the big majority of these signals originate from Eastern Europe and,more especially, the Soviet Union. However, we have NO access to most administrations responsible for these transmissions It is the opinion of your Co-ordinator that it is essential to seek ways to change this. Assistance from the EC and/or AC is needed. Maybe "glasnost" can open some closed doors in the future? IARU Region 1 Division Conference 1-6 April 1990 Spain." **ar**

WARC 92 UPDATE

DAVID WARDLAW VK3ADW
WIA WARC-92 TEAM LEADER

In order to prepare for Australian participation in WARC-92, the Department of Transport and Communications has formed the Australian Preparatory Group for the WARC-92 (APG WARC-92)

The first meeting of this group was held in Canberra on February 8

The attendance of 50 was drawn from the following organisations AUSSAT, AUSTEL, ABC, AWA, CAA, CSIRO, Department of Administrative Services (IPS), Department of Defence, Department of Foreign Affairs and Trade, DOTC, FACTS, Philips RCS, Public Broadcasting Association of Australia, Telecom and WIA, together with a number of individual consultants.

The WIA was represented Ron Henderson VK1RH and myself

Major allocation topics were identified as:

1. Additional spectrum for HF-BC.
2. Additional spectrum for mobile and mobile-satellite services in the 1-3 GHz band
3. Spectrum for high definition television (HDTV).
4. Spectrum for the sound broadcasting satellite service (SBSS).
5. Review of radio determinitation satellite service (RDSS) sharing criteria.
6. 20 GHz and up spectrum for new space services.

Broadcasting interests reported that there was significant overseas pressure for additional spectrum for international HF broadcasting and that a number of administrations wished to further extend national broadcasting on HF Australia uses HF national broadcasting in its tropical zone in accordance with ITU regulations.

At present, HFBC planning is incomplete, and some consider that no more spectrum should be allocated for broadcasting until the planners indicate that it is required.

It was claimed that international HF broadcasting was popular and had a significant audience.

UHF Bands and Up

The following requirements for additional frequencies in the UHF and up section of the spectrum were indicated

Mobile Sat	2-3 MHz
HDTV	500 MHz
SBSS	2 MHz

The amateur bands involved are 1240-1300 MHz and 2300-2450 MHz The danger is a change in sharing arrangements which could be disadvantageous to the Amateur and Amateur Satellite Service Above 20 GHz. We will need to retain our existing Exclusive Allocations and maintain our wider sharing arrangements. There could be some difficulties in this part of the spectrum which may not seem important at the present time but could be very much so in the future.

HF bands

The major problems on the HF Amateur Allocations will most likely be on the 7MHz band. On this band the amateurs in Region 2 share 7100-7300 kHz with broadcasting in Regions 1 and 3. At present in Australia we have an extended 7MHz band on a non-interference basis.

It is also possible that there will be pressure on the top end of the 3.5MHz band. This pressure already happened at WARC-79, although at that stage it did not affect Region 3. However, we must be prepared.

Committee Structure

Four committees were set up to examine and develop draft Australian inputs and delegation briefs for the JIWP (WARC-1992) and also for the WARC-92 conference relating to:

F Frequency Allocation matters
T. Technical matters
R. Regulator matters
A. Administrative and policy matters plus overview

A fifth committee, H, was set up to examine and develop a draft Australian input and delegation brief for the WARC HFBC-93. This committee relates to broadcasting planning issues only and excludes frequency allocation issues.

The WIA will be represented on committees F and T. At present there are no regulatory matters concerning the amateur service on the agenda, so representation on committee R is unnecessary. Committee H is only for HF broadcasters.

In the frequency range 960 MHz - 3.4 GHz DOTC are developing a paper which will be available for comment in March. There will be a draft spectrum plan in March also. (Not available at time of writing).

The following is the initial Amateur and Amateur Satellite Service submission to the APG

(The WIA, together with the IARU, considers the Amateur and Amateur Satellite Service as one).

The Amateur and Amateur Satellite Service

Amateur Service: a radio-communications service for the purpose of self-training, intercommunication and technical investigations carried on by amateurs, that is, by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest.

Amateur-Satellite Service: a radio-communications service using space stations on earth satellites for the same purpose as those of the Amateur Service.

The above are nos 3.34 and 3.35 of the definitions in article 1 of the Radio Regulations of the International Telecommunication Union

The Amateur Service world-wide, uses, or experiments with, virtually every aspect of the art of radio communication, from the most simple to the most sophisticated.

It is the urge of the amateur to experiment and to communicate that is expressed in different countries in different ways. The self-education of individuals or the establishment of classes for those who desire to qualify as radio amateurs provides a basic education for many who would not otherwise acquire that knowledge

Whether it is a simple telegraphy transmitter for the novice or the satellite for the advanced amateur, both are learning. The amateur is restricted in the matters that may be the subject of his communication. His common interest with all other amateurs in the world is his interest in the radio art, and by that inter-communication knowledge is exchanged and expanded

The knowledge and experience of communications, and the existence of the equipment that the amateur uses, provide a valuable resource that in many countries cannot be found in any other service.

The most important features of the Amateur Service are

(1) It makes unique provision for advancing an individual's skills in both the technical and operating phases of the art, thus helping to provide a reservoir of trained operators, technicians and electronics experts. It also provides an avenue for further investigation for those already involved in this field
(2) It has a unique ability to enhance international goodwill
(3) It is a voluntary, non-commercial service

The interests of radio amateurs are as diverse as the number of countries and regions in which they are located

The basic desire to study radio communications with the opportunity for practical application leads to

(i) The acquisition of experience and skill in communication techniques and operating,
(ii) contact and interchange of information with others having similar interests,
(iii) furtherance of the unique ability of the radio amateur to promote international goodwill,

(iv) contribution to scientific research by participation in a programme organised on a national or international basis; and

(v) participation in communication systems including emergency communication by both training and assistance, when required

Reference has been made to the urge to communicate. The Amateur Service provides a trained, regulated and disciplined outlet for that desire. Otherwise, that urge, and the desire to experiment with communications, might find its outlet in undisciplined, illegal and perhaps potentially dangerous transmissions

An important aspect of the Amateur Service is that because the amateur must be qualified and then licensed by his administration he is known and recognised. The amateur zealously guards his spectrum allocations and rejects the improper use of the frequencies allocated for his use. Such improper use cannot go unnoticed, nor can unauthorised users hope to remain undetected. It would be a foolish act to operate a clandestine transmitter in an amateur service allocation.

Many administrations rely heavily on the fact that the Amateur Service is a safeguard against unauthorised use of radio communications.

ssues of Concern to the Amateur Service

1 HF

While realising that the decisions of WARC79 did not satisfy a number of countries with regard to the amount of spectrum allocated to the HF Broadcasting Service, and that Recommendation 511 of HFBC-87 suggests the possibility of extending the frequencies allocated exclusively to HF broadcasting, the Amateur Service feels that it would not be desirable, bearing in mind the time constraints of the WARC, to review the whole of the HF spectrum

2. UHF

The Amateur and Amateur Satellite Service only has shared access to its family of frequencies in this part of the spectrum; currently satisfactory in the 1240-1300MHz band, but difficult in the 2300-2450MHz band.

The Amateur and Amateur Satellite Service would hope that consideration would be given to the peculiarities of amateur usage of these bands.

3. Above 20 GHz

The Amateur Service has a family of small exclusive bands, all contiguous with larger shared bands where amateurs are secondary

This was felt to be the most satisfactory way to make provision for future usage with the least difficulties.

Conclusion

As can be seen from this report, a number of amateur bands will be threatened at this limited allocation WARC.

As with the WARCs in 1959 and 1979, the WIA is actively looking after the interests of the Amateur and Amateur Satellite Service for all Australian amateurs. As the President of the IARU said, the best way you can support the Amateur Service is to belong to your national society

A great deal of energy was exerted at and before WARC79 to preserve your 50MHz band, the top two MHz of the 144MHz band, and the 20 MHz of the 430MHz band that most of the rest of the world lost. We gained three new HF amateur bands, 12 new amateur satellite allocations and five new bands above 20 GHz.

It is somewhat disappointing to note the large number of amateurs who are non-members of the WIA and are prepared to accept the privileges obtained by the WIA effort and finance without accepting the responsibility of membership. Thank you WIA members. **ar**

SILENT KEYS

We regret to announce the recent passing of:-

Mr Keith Howard	VK2AKX
Mr Arnold Cresswell	VK2DLK
Mr K A Robson	VK2PLJ
Mr Harrison Chapman	VK3GU
Mr Rob Jennings	VK3AF
Mr Ken Gott	VK3AJU
Mr Vic Gay	VK3EVG
Mr Jack Lester	VK5LR
Mr Joe Burns	VK5UJ
Mr B P Williams	L50496
Mr M R Pitman	VK6SN
Mr Doug Watson	VK7DW
Mr C K Perry	VK8KP

Vic Gay VK3EVG

Sadly I report that Vic Gay VK3EVG passed away on the 7th February this year aged 80 years. Vic gained his NAOCP when he was in his seventies through sheer diligence and perserverance. Some time later, he got his AOCP and became VK3EVG

Vic was a self-effacing dedicated amateur, ever ready to help anyone with gear, manuals etc.

He was a member of the Moorabbin Radio Club and was always the first to volunteer to build cupboards, tables etc, and he assisted in the re-vamping of the Club station. He never broadcasted such activities

The late Vic Gay VK3EVG

He was the founder, together with Colin Cole VK3DEG, of the Early Birds' Morse Net. This was a Morse training net for Novices wishing to upgrade to the AOCP. It is now in its sixth year and still going strongly. Vic attended each session, practically every morning, and was always happy to send a Morse Test when required in his easily recognisable, copper-plate fist. No computers or bugs for Vic just the old PMG key

Vic and his wife Ivy loved Australia, and travelled in their sweet-running EH Holden all over Australia. He used his HF and 2 metre gear during these trips, and what Vic didn't know about such transmissions was of no consequence.

On the morning of the 7th February, the listeners on the Net heard Vic make a mistake while sending a Morse piece but no correction signal was sent, a few blips followed, then silence. It was all over, another dedicated amateur had left our ranks.

Vic Gay was a gentle man with a gentle touch

Q Foster (Ex VK6QF)

Rob Jennings VK3AVJ

Rob drowned at Lake Glenmaggie on November 7, 1989 whilst on holidays with his family over the long weekend. Rob was an extremely active person who excelled at everything he undertook, achieving great success academically and athletically. He had the ability to apply his knowledge in a practical manner, which was demonstrated by the number and diversity of projects he undertook.

He will be sadly missed by all his friends, who extend deepest sympathy to his wife Jill and sons Christopher, Luke and Matthew

Geoff Eley VK3KAS

Jack Lester VK5LR

I have been in constant contact with Jack for some 32 years — right up to his death on 9th February 1990, in his 88th year

Jack had a varied career. He obtained his Industrial Engine Driver's Certificate on 3/4/1929: Amateur Radiotelegraphy 1930: Full Amateur Licence, Radiotelephony July 1935. Broadcast Operator's Certificate, March 1941.

He was employed at Renmark Power Station, SA, in his early years. After leaving Renmark he conducted an electrical business in Berri, SA.

He later joined Radio Station 5RM where he stayed until transferring to 5DN in Adelaide.

He left 5DN to join the Radio Branch of the PMG (as it was known then) in the workshop and later at the Transmitter Site at Mt Bonython

I am sure the VK's 5ON, 5FJ, 5ASW, 5AVR, 5BOL and many other "Hams" will join me in saying we shall sadly miss a sincere and genuine friend of long standing.

Bill Crawford VK5XB

Joe Burns VK5UJ

It is with deep sorrow that I announce the passing away of my father Joseph Stewart Burns (VK5UJ) on October 30th 1989, aged 76 years

"Uncle Joe" as he was fondly known by his many amateur friends, had his QTH in Napperby near Port Pirie, where he retired after finishing his working career in the State Government in Whyalla South Australia.

It is difficult for me to write this letter to Amateur Radio, as I not only lost a great father, but a true mate. It was his influence and guidance that led me into a successful career in Radio Communications in the Public Service.

Joe was a Marine Engineer by trade, but developed an interest in Radio when I was a teenager. Dad had a shed down the back yard, where he spent hours tinkering with valve radios and amplifiers, and this is where I whetted my appetite and took radio on as a hobby.

In 1955 I joined the then PMG Dept as a Technician-in-Training, and we both got heavily involved in radio projects, especially the 1 metre "Pirate Days" as some of the old timers will remember

In 1958, my father and I sat for our "Limited Certificate" and were both successful.

Dad's call sign was then VK5ZCP and mine VK5ZDI.

In late 1962, I was transferred to Darwin, and we decided to concentrate on our morse (then 14 wpm) to obtain the full licence so we could keep in contact on the HF bands.

"Uncle Joe" beat me on this, when he passed his in mid 1964 and I got mine in mid 1965.

From then on, we kept regular skeds twice a week on 20 metres, and progressed over the years through various modes from AM to SSB to RTTY.

These sessions over the past 25 years became very familiar to many amateurs and short wave listeners. Dad's life revolved around his family, the local community and amateur radio, and he gained the love and respect from people in all these areas as he was always there to give help and guidance when needed. His departure has left a big gap in our lives.

Dad had known of his illness and the inevitable outcome for some time, but kept it a secret from his family and friends so as not to distress them, until it became obvious in the last few weeks.

To our many amateur friends who sent condolences to our family, I thank you sincerely, and know the memory of VK5UJ will remain in our hearts for eternity.

First Harmonic

Barrie Burns VK8DI

Keith Harris Howard VK2AKX

Keith Harris Howard VK2AKX passed away suddenly on Thursday 1 March 1990.

A devoted family man, Keith was a natural educator and a mentor to many. He lived and breathed Amateur Radio.

Born 30 October 1930 in Cessnock 30 km west of the City of Newcastle, he was educated at West Cessnock Primary, Cessnock High School and then the Armidale Teachers College. After graduation in 1950, Keith's first teaching position was in the north-west NSW town of Gwabegar.

In 1954 Keith made the first of four visits to England and Europe. Whilst on his first visit to England he gained his Certificate of Engineering.

The late Keith Howard VK2AKX

He returned to Australia in 1959 and taught at Blackalls School before joining the staff of the Booragul High School. Not only a trained teacher, Keith was a born educator and specialised in teaching learning-impaired students. He worried about each of his students and gave them his all until having to take early retirement from teaching.

In 1970 he visited the Osaka World Fair and continued on to Europe via the Trans-Siberian Railway. It was on this trip that he met Etsuko, and they were later married in London. He returned to England in 1972, then taught for a time as a specialist maths teacher in Saudi Arabia, before returning to Australia in 1974. He had a rare ability to master numerous languages, speaking Russian and Japanese fluently. For a number of years he taught English to the many migrants who were located at the large transitional migrant camp in the northern Newcastle suburb of Mayfield. A language he could never master was Finnish

During his lunch hours at high school Keith listened to DX on a 40m receiver. His maths master Jack VK2ADT was an amateur radio operator and advised Keith to join the WIA. Thus at the age of fourteen began his life long love of the hobby. Strangely, it wasn't till Keith was in England in the early fifties that he first became licenced as a radio amateur, receiving the call sign G3NDH. It was on his return to Australia that Frank Hinks, the District Radio Inspector in Newcastle granted Keith a reciprocal call of VK2AKX. Keith must surely have been one of the few Australian-born amateurs who had never sat for his amateur exams in their own country

Keith lived and breathed both Amateur Radio and teaching; it was logical that he

should combine both talents. he believed the future of any organisation lay with the youth of the land. As a teacher, he understood the need to instil knowledge effectively in the young. He gave his whole hearted support to the new Youth Radio Scheme, becoming one of the program's examiners.

In 1960 at the instigation of Rex Black VK2YA, one of the founders of the Youth Radio Scheme, Keith established the Booragul High School Radio Club, one of the first such school clubs in Australia. Five of his pupils gained their amateur radio licences. One of them was Susan Brown VK2BSB who was the first-ever school girl to become a radio amateur in Australia. Susan went on to become President of the NSW Division of the WIA.

Keith joined forces with Rex Black and others to promote the concept of the Novice Licence. Never afraid of fighting the establishment, he was intolerant of elitism and needless conservatism. The Novice proposal shocked the Amateur Radio and PMG establishments to the very foundations. Keith and others travelled to WIA headquarters in Melbourne to argue for such a scheme. The opposition was enormous but Keith never relented. Yet a decade was to pass before the then PMG relented and introduced the Novice grade licence.

It is a tribute to Keith that so many of his school and later Westlakes Radio Club pupils went on to achieve success in the electronics and electrical areas both at degree and technician levels. Over fifteen of his pupils went to become electronic, electrical or computer engineers. He had the rare ability to make electronic theory seem simple and logical.

An accomplished writer, he wrote a number of books amongst which was a treatise on map reading. Few are aware that Keith was fellow of the Royal Geographical Society. Undoubtedly his crowning glory was his Manual of Questions & Answers for the Novice Licence. It has sold over 30,000 copies becoming one of the all-time best selling books in Australian history, and the definitive text for use in Australian schools, radio clubs and correspondence courses. A whole generation of VK novices studied that book in order to pass their exams.

From his licensing as a VK he was involved with the Hunter Branch of the WIA VK2 Division, compiling and reading the branch's weekly news each Monday night using the branch call sign of VK2AWX. He transmitted these broadcasts from the basement of his mother's Bolton Point home. For a number of years he wrote a weekly bulletin that was published in the *Newcastle Morning Herald* and *Amateur Radio*.

In 1964 Keith fell foul of educational bureaucracy when a school's inspector was horrified to hear he was running an Amateur radio club at Booragul High School. The inspector was convinced Keith must have been causing interference to any aircraft passing overhead and that he should be stopped immediately. Thus ended a successful experiment at the school.

Undaunted, Keith along with some amateur friends then founded Westlakes Radio Club in a little church hall at Teralba so as to continue training his school students. Little did he realise the club, later to become the Westlakes Amateur Radio Club would one day be arguably the largest in Australia. Under Keith's tutorage hundreds of students successfully went through his classes and thousands more studied his text books on their way to success.

One of his innovations was to institute an on-air basic electronics course called "Electronics by Radio". Such a course was strictly illegal, but Keith soon found the flaw in the regulations. There was no reason why two amateurs could not hold a conversation, one asking questions, the other answering them. Keith used his own call sign whilst John Bedford used the club's call sign of VK2ATZ. Strangely, there was only one signal. Keith and John were in the same room! John would ask a question and pass the mike to Keith for the answer.

Assisted by Bruce Morley VK2ZNB, Keith was the first VK on 160m after the band was opened up to Australian amateurs. Using an AT7 with homebrew modulator, the pair was still frantically wiring with just ten minutes to go. Somehow, the job was completed in time and at exactly one second past midnight, the call sign VK2AKX was heard loud and clear on 160m AM.

At Keith's instigation, the Westlake's Novice Contest commenced in 1977. Three years later when the WIA took the contest over it became the Australian Novice Contest and the perpetual trophy was named the "Keith Howard VK2AKX Trophy".

Keith's work for amateur radio was recognised in the late seventies, when he was elevated to life membership of the Wireless Institute of Australia.

Keith's ability with the pen, his articulate speech and his brilliantly sharp and analytical mind made him a fearsome opponent whether defending a colleague, amateur radio or himself against the injustices of bureaucracy. Never afraid of authority at any level, he would challenge without hesitation if he thought a wrong had been committed. Woe betide the clerk or official at the PMG or its successor the Department of Communications, when Keith was in full flight against bureaucratic inertia or ineptness. Keith's onslaughts were always logical, accurate and to-the-point. He was a brilliant tactician.

He was the driving force behind the VK2 QSL bureau which has been run by the Westlakes ARC for a number of years.

Keith was a man of honour, integrity and high principle. He was a father figure to both the many students who passed through his hands and the many Westlakes club members. Our grieving is not just for the loss of a great man, but for the loss of part of our lives. Keith was a friend, a confident and a father figure to so many.

The tradition lives on in part for his fourteen year old son Minoru who is VK2MIN.

To his wife Etauko, his two sons Minoru and Satoru and his family, we grieve with you and to Keith we say thank you for the honour of having known you.

Seven three Keith, your memorial is a generation of amateur radio operators who got there because of you.

WESTLAKES AMATEUR RADIO CLUB ar

Morseword No 37

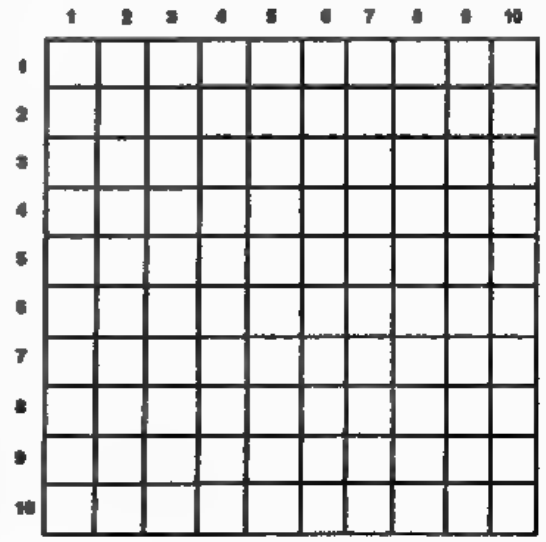
Solution on page 61

Across

1 Quality of sounds
2 Take the top off
3 Be fond of
4 Willingly (archaic)
5 Two dozen
6 Minerals
7 Pen
8 Sheep
9 5 x 8 6
10 Competes

Down

1 Young Elizabeth
2 Prison
3 Not the dashes
4 Increased
5 Swamp
6 Whole
7 Secondhand
8 Egyptian goddess
9 Consent to
10 Be enthusiastic



Audrey Ryan © 1989

OVER TO YOU

ALL LETTERS FROM MEMBERS WILL BE CONSIDERED FOR PUBLICATION AND SHOULD BE LESS THAN 200 WORDS.
THE WIA ACCEPTS NO RESPONSIBILITY FOR OPINIONS EXPRESSED BY CORRESPONDENTS.

In Defence of Importers

(In the March issue we published a letter from John Woodings VK6AJW entitled "Blatant Greed". This was the writer's own title for the letter, and was not chosen by us. However, it had been intended to follow the title with a question mark. This was inadvertently omitted. The letter was published purely as an expression of the author's opinions, with no intention of implying support or otherwise of these opinions. The following letter has now been received in rebuttal of the claims by 6AJW and is published in its entirety as a very cogent defence of importers' pricing practices. Ed)

As always, as a member of the Wireless Institute, I eagerly await the arrival of my Amateur Radio magazine each month. Unfortunately, this month I had to swallow a lump when I got to the letters. Not only do I find that you have permitted one of your advertisers and long-time supporters to be maligned without any option of early reply which you have extended in the past, but to find that your own choice of headline for this letter would seem to indicate that you agree with the remarks which were made!

In relation to the letter from John Woodings, VK6AJW, I would like to make a few points:

1. We would dearly love to be able to sell the MFJ-1278 for the US advertised price of $279.95 (MFJ Catalogue of January 1990) but we can't because, unlike Mr Woodings, we have to pay freight, exchange cost, import duty of 21 per cent and sales tax of 20 per cent, which he has avoided by bringing in the goods personally when he returned from overseas.
2. If Mr Woodings expects to be supported by local suppliers then he must offer some loyalty in return. I assume he was supplied with an Australian type approved plug pack and that he doesn't mind sending the unit to the USA for warranty service!
3. If Mr Woodings is prepared to take the risk of quality on vacuum tubes of unknown origin then don't complain about the fact that sellers in this country always insist on NEW product from known and reputable sources
4. The 572B is available from my stock in Melbourne at $175.93 plus the ubiquitous sales tax, making it $211.12 for brand-new prime-quality product. I hate to think of someone paying $395 for it.

Let's look at the example of the MFJ-1278 which your writer has used and see how the selling price of $A595 is reached. Let's take a shipment of 10 units and use my actual costs:

10 MFJ1278s, my cost $US223.96	$US2239.60
Freight from factory to airport in USA	$US80.00
Manufacturer's export fees	$US78.50
Total for goods	$US2398.10
Converted to $A at 0.75	$A3197.47
Import duty at 21%	$671.47
Air freight from USA	$430.35
Airline document fees	$5.00
International terminal fee	$20.00
Delivery to our store	$17.00
Financial Institutions Duty	.75
Customs Agent's fees	$83.00
Total cost in my store for 10 units	$4425.04

Which equates to a cost of $442.50 each. Now the price of $595 at which I advertise the MFJ-1278 includes the final insult from Mr Keating of 20 per cent sales tax, so the price before tax is $A495.83, which leaves me $53.33 each in profit, or less than 10 per cent with which to pay my staff, pay the rent, pay the gas and light and power, support the WIA with advertising, answer queries and look after all the after-sales support, warranty service, storage and the like. What a joke!

When you look at it that way, the greed is on the part of those who bemoan the lack of a local industry, and when somebody does try to do something for them they get it thrown back in their faces. Not very encouraging, is it? We can save some costs by bringing in larger shipments, but it doesn't make more than a $20 per unit difference what we do.

You might well ask why we do it? Well, in this company we took a conscious decision that we should support the amateur fraternity by supplying good quality products at REASONABLE prices. So we do it because we are amateurs (VK2ESD and VK3ZJF) and because we believe that most people support what we try to do.

That then brings us to the point as to why we should support the Wireless Institute and its magazine. Not only do we have to compete with other commercial organisations, such as Emtronics, Andrews, Captain Communications and the rest, which we do willingly on a sensible commercial basis, and rightly so. But, now we find that we are forced to compete with the Institute itself! We see ads for the VK2 division selling radios; now we hear that the VK3 division is starting to sell connectors and cable, the Melbourne Packet Radio Group, the advisory body on packet radio, is acting as a commercial body, selling packet gear, as is the Australian Amateur Packet Radio Association in Sydney'

These bodies are supposedly non-profit, non-commercial bodies established to serve the interests of the amateur community Maybe they should get their own houses in order by providing the services and impartial forum they are supposed to provide, but on the whole don't. What is even worse, is that now they have a commercial imperative which means they can no longer fulfil that role.

If any or all of these bodies expect any support at all from the amateur equipment industry, then maybe the amateurs and the organisations should take stock of what they do, how they operate and what they say After all, nobody could reasonably expect us to offer financial support to our competitors, would they?

Would Mr Woodings please accept my order for 100 MFJ-1278s at $A289 I need some profit to pay for the paper to deal with that sort of totally unwarranted and uninformed criticism. Yours sincerely,

JOHN DAY VK3ZJF
TECHNICAL DIRECTOR
STEWART ELECTRONIC COMP PTY LTD
44 STAFFORD ST HUNTINGDALE 3166

In Further Defence . .

In response to John Woodings VK6AJW letter in "Over to You", March 1990

Firstly, I would like to illustrate the costings on a typical spare part from an overseas supplier. Let's take a USA - sourced product:

— Nett price ex works	$US100.00
— Exchange rate	$US0.75 = $A1 00
— Import duty	21%
— Overseas freight	Sea = 10%. Air = 12%
— Inland freight	4%
— Packing	2%
— Clearance, local delivery etc charges	6%

— Factors Sea = 1.43 × 0.75 = 1 906; Air = 1.45 × 0 75 = 1.933

Small parcels, etc tend to be sent air freight from the USA.

Therefore, 1.933 x $US100 00 = $A193.30 landed cost

Once having received the stock into the warehouse or store, one has to handle it, store it, pay staff to sell it, fixed and variable overheads need to be paid (eg: rent, telephone, salaries, worker's compensation, payroll tax, superannuation, etc, etc, etc).

And then, finally, return a worthwhile profit to the vendor

Unless one turns his stock over rapidly, there is also a 20 per cent interest factor which has to be applied to the landed cost for bank charges on overdrafts etc.

Bearing all this in mind, a 100 per cent mark-up is not unreasonable and, as a minimum, I would suggest a 70 per cent mark-up, returning a gross margin to the vendor of 50 per cent and 41 18 per cent respectively

$A193.30 x 2 + $A386.60 retail, plus sales tax

or $A193.30 x 1 7 = $A328.61 retail, plus sales tax

The above example is fairly typical of what actually occurs in the real commercial world.

Having got the mathematics out of the way, the other factor to be considered is good old market forces.

A supplier will, if he's marketing oriented, obtain the maximum price, and therefore profit, for goods and services he sells.

This is entirely a product of free market forces.

Basically, if a supplier tries to sell left-handed widgets at $50.00 each, but most other suppliers sell them for $25.00 each, he's not going to sell very many. And, he will probably go out of business eventually

Of course, other factors beside price also play a part in the market force equation, eg: service, delivery, availability, etc.

And, last of all, and this is purely a personal observation, having been in a business some years ago that sold amateur, CB and commercial communications products, amateurs and CBers would be some of the most difficult people to deal with; and dare I say, in many cases with little commercial experience or exposure to make objective judgments about such matters.

In closing, has anyone ever wondered why we see only a small percentage of the equipment available on the US market here in Australia?

All other considerations aside, the main reason I would suggest is simply that we have a population of 15-16 million, with an amateur population of 18,372 (ref p6, AR March'90 WIA News), 0.118 per cent of the national population (approx)!

The short answer is that it is not commercial viable.

BRUCE R KENDALL VK3WL
8 WALWA PLACE
WERRIBEE 3030

Import Costs Again

Like John Woodings (Over to You, AR March) it takes a lot for me to bother finding the time to write any more than I have to, but 'Blatant Greed', I ask you, is this fair to your advertisers, and to Australian business?

John fails to mention the costs of a multitude of other goods as compared with their costs overseas, especially from countries with the broad consumer base they have in America. Did he say how much cars cost there? Or mowers?

Importers have many additional costs such as sales tax, duty, freight, exchange rate differences, insurance, advertising, and even dockers' strikes to consider when pricing their goods for retail sale. Fixed costs must be shared by the very few customers serviced, this is a price we must all pay because there are so few of us. Consider the WIA membership debate if you will.

John is one of the few amateurs who are affluent enough to actually go to America, but the cost of his ticket there should also be added to the price of the goods he bought; the prospective importer often has to make the same trip for business purposes.

Rather than whinge about supposed rip-offs, why don't all those whingers try getting into business for themselves, or shutting up about that which they know little, and supporting Australian business. If everyone went overseas to buy amateur (or anything) there would be no local market at all.

Oh yes, I nearly missed mentioning one of the most important aspects of buying foreign goods. If it goes wrong, who is going to fix it? Where will the spare parts come from?

Honest John might 'honestly feel that it is a blatant case of utter and unashamed greed' and, in some cases, that might indeed be so, but it is only dumb, dumb, dumb to let yourself be 'ripped off'.

In my own business I meet the occasional customer who remarks that a certain price is a 'rip off'. I then either point out that he can look elsewhere (at his own expense) for a better price, or he can go without. No retailer can force a customer to pay, so if you pay what you think is an exorbitant price, then you have only yourself to blame.

I can see that sitting back and complaining about all and sundry is going to make this country great . . . yeah, a great flop.

GILBERT GRIFFITH VK3CQ
7 CHURCH ST
BRIGHT 3741

More VNG Feedback

The list of the sort of people who use VNG which M Leiba details in the February issue of "AR" is very interesting.

It seems to me that they could derive the information they require from WWV anyway, but if they must use VNG then the DOTC should authorise its operation elsewhere in the spectrum where it will not interfere with the acknowledged international time and frequency standard.

I believe that it may be indicative of the VNG users consortium's breadth of concern for equity of all that caused M Leiba to include, as an apparent afterthought to the list, "other users" which include surveyors and navigators.

The consortium should be aware that these people, particularly the latter, have used WWV as a source of standard time for decades. As well, they benefit from WWV's weather warnings, a service VNG does not provide.

These facilities are used by people all around the world, and I doubt they really want to wait or, indeed, are able to wait, for VNG to cease transmission so they may"glean" this information from WWV.

The points that need to be made are:

- VNG is an authorised intruder
- It should be allocated other frequencies
- The WIA should act responsibly as it does with all known intruders and actively seek to have interfering transmissions stopped.

D H WATKINS VK2DDR
9 WILLAWA ST
BALGOWLAH HEIGHTS 2093

(Comments need to be made on your three points. VNG is authorised by the relevant authority (DOTC) and is on frequencies allocated to its type of service, thus it is not an intruder. Its operators would prefer other frequencies, and are still negotiating. The WIA has no Intruder Watch jurisdiction over non-Amateur frequencies. Ed)

VNG Defence

Knocking VNG seems to be becoming a popular pastime in recent months, but one writer seemed to have the uneasy feeling that he was being rather disloyal. Maybe it is worth considering that VNG is an Australian product! It was developed with dedication over more than two decades, and revived by the grass-roots efforts of a number of Australians who believed we should have our own standard frequency and time-signal service, rather than relying on those from overseas.

However, what really gives me the pip (excuse the pun) is that these people do not bother to check all their facts before they blossom into print. This applies particularly to points 1 and 2 below.

1 VNG's role as a frequency standard.
VNG is now operating at Llandilo in the same manner it did at Lyndhurst, so the transmitted carrier frequencies are such that average daily deviations do not exceed +/-1 part in 10^{11} Enough said?

2. Frequency allocation
VNG's frequency allocation problems were discussed initially in March 1989 AR, pages 16-17, and then in November AR, page 40 A welcome piece of news is that DOTC has advised that it is working on allocating 16 instead of 15 MHz. Our users hope this comes about, as they find the interference to VNG by WWVH/WWH and other time services annoying, too! By the way, do not forget there are several others, including BPM (China), BSF (Taiwan) and JJY

(Japan) on the same frequencies. BPM sounds like VNG and sometimes comes in very strongly. I wonder whether some of the interference blamed on VNG is in fact BPM.

3 Telling the time with VNG
It is true that VNG does not have voice time announcements each minute, but it does have a BCD time code which is the CCIR-recommended method of transmitting this information. Also, in last month's AR, page 26, I explained how to use VNG to tell the time without deciphering the BCD time code. I am sure this method will not be beyond the intelligence of my fellow amateurs!

4. Is VNG more trouble than it is worth?
While WWV and WWVH may be almost continuously audible if you have a good antenna, we found their signals not continuously sufficiently strong for scientific field work and even at many base stations. Also, users were concerned about figuring out the correct propagation delay. They preferred to support the revival of VNG. Believe me, this resuscitation effort has cost us a lot of energy, expense and (dare I say it?) sacrifice, and we would not have undertaken it if we hadn't considered it worth the effort. We are not masochists! Just a reminder that we do have amateur radio supporters as well. They do not write to AR because they don't have anything to complain about. They contribute to the Consortium to help keep VNG on air instead!

Marion Leiba (Dr) VK1VNG/VK1BNG
Honorary Secretary
VNG Users Consortium

VNG and Economics

Two subjects —

A. Let me add my voice to those objecting to VNG on 5, 10 and 15 MHz. When I read some time ago that VNG was to return to the air, I thought "beauty". When I found that it was to occupy some of the frequencies used by JJY and WWV, I thought "what . . . . dreamed that up?" Now we learn that it's the DOTC to blame. One might have hoped it had more sense. Please use the good offices of the WIA to ask DOTC to allow VNG to move to 4.5, 7.5 and 12 MHz (or 16 MHz).

B. I do not agree that WIA membership fees are too high, but the argument that the VK4 fee is $1.25 per week is spurious. The reality of the matter is that the fee is $65.00 and payable RIGHT NOW, and just after Christmas, too! I have seen too many wives of co-workers lined up outside the office door on pay-day to have many illusions about disposable incomes.

Many amateurs may have equipment worth several hundred or a few thousand dollars in the shack. How many of the new rigs are on the never-never, and how many of the other, older rigs are five, 10, 15, 20 and more years old? My shack is fairly well equipped. I have a CRO and a signal generator. Both are well over 30 years old. Hey — anyone got a schematic and component values for an R.A. Ratcliffe model 200 signal generator? It features three 6V6GT and one 6X5GT valves, plus a power rectifier. I can't identify. Help!

K G England VK4JPE
31 Morgan St
Rockhampton 4700

Service Recognised

On January 16, 1990, I was awarded the National Medal and Clasp for 25 years community service by the Queensland State Emergency Service.

In the citation for the award were included the following:

Service in:

1) Civil Defence Organisation — 2 years
2) State Emergency Service — 15 years
3) RAAF Reserve
4) WICEN — 25 years +

In acknowledging the assistance to the SES and the community by WICEN, the SES has honoured not only me, but all amateur radio operators of North Queensland, both past and present, who have participated in WICEN operations.

This WICEN activity stretches back past the national net for Darwin following Cyclone 'Tracey', right through many more emergency operations such as Cyclone 'Winifred' up to the present day.

I am proud to have led this group of dedicated amateurs, and humbled by this award, which has only been made possible by their efforts as well as mine.

Ted Gabriel VK4YG
PO Box 245
Ravenshoe 4872

Aussie Tolerance?

Our persuaders are making much of some emotive Ockerisms lately — "the fair go" is a favourite; "dinkum" is not getting a fair go.

Many of the persuaders are not dinkum members of the ARS and would be more convincing if they were. So how about it, get fair dinkum, don't be content to hang around at Limited or Novice level; "there are 'igher things fer blokes ter do". Have a go at becoming dinkum, complete with an unrestricted licence and lots of operating time on CW.

Fair crack of the whip, "use it or lose it" they say, so do yer bit and help those internationals at the CW end of the HF bands cryin' out for a natter with a dinkum Aussie brass pounder.

Don't be left for dead, if you won't make it to full call yer should be barred.

Note: correspondence coaching for Novice and AOCP theory is available from address below. The cost: 100 x 230 SAE.

By the way, for Ted Gabriel's information, the "proword" ROGER has been superseded for several years by ROMEO.

Lindsay Lawless VK3ANJ
Box 112
Lakes Entrance 3909

(I guess, by "persuaders" you mean WIA office-bearers, Lindsay. Some who have Limited or Novice calls find that these permit as much activity as they have time to enjoy. Not everyone thinks CW DX is the pinnacle of radio achievement. Ed).

RAAF History

I was a member of the RAAF during World War II and served as a Wireless Maintenance Mechanic. I am documenting the history of the training and working of this trade group which was trained in Melbourne at No 1 STT (Exhibition Building) and the Melbourne Technical College from late 1941 onwards.

I would like to hear from any ex-members who trained as Wireless Maintenance Mechanics who may be able to add to my information.

Don Brown
ex 50021 RAAF
158 Majura Ave
Ainslie ACT 2602

Pecking order?

I write this in early February, and it is over three months since I last heard the woodpecker.

Is it a miracle, or have the little boys found a new toy to play with?

Les Hawkins VK4DA
15 Coomber St
Bundaberg 4670

(As described in the article by VK5PU in AR May 1986, the Soviet OTHR was even then obsolescent. Maybe it has now been retired! Ed)

Have you advised the WIA Executive office of your new callsign?

Use the form on the reverse of the Amateur Radio address flysheet.

FTAC NEWS

JOHN MARTIN VK3ZJC
ACTING CHAIRMAN, FTAC

Data Base

The beacon and repeater Data Base published in February "AR" is being revised at present. Please notify FTAC of any additions or corrections to the list.

New 5650 MHz Record

FTAC has verified the claim of Nick Tebneff VK5NT and Des Clift VK5ZO for a new record on the 5650 MHz band. On November 12, 1989, Des operated portable with a 40 mW Gunn oscillator and a 600 mm dish, while Nick used a 140 mW klystron and an identical dish. The mode was wide band FM using a 30 MHz IF. This contact is a new national record for the 5650 MHz band, the distance covered being 176.4 Km

Don't buy stolen equipment

Check the serial number against the WIA stolen equipment register first.

New 23 cm Band Plan

Details of the new plan were published in the 1990 Call Book and on page 13 of February "AR" Any comments on this plan would be most welcome. **ar**

HF PREDICTIONS

ROGER HARRISON VK2ZTB
THE APOGEE GROUP

April Charts

For ease of use and to accommodate space restrictions in the magazine, I have provided predictions applicable for three major regions of Australia:

VK EAST Covers the major part of NSW and Queensland.

VK SOUTH Covers southern-NSW, VK3, VK5 and VK7

VK WEST Covers the south-west of West Australia

For each of these regions I have selected six "terminals" to major continental regions of the world, or regions of particular interest, such as Australian Antarctica (VK ANTARCTIC). From time to time, I will include predictions to cover particular expeditions or other activities of special interest. This month, I've included predictions for the long path to Europe.

Feedback from readers and users would be most appreciated - let me know what you feel is wrong, and what's right, about the paths, presentation or any other aspect.

The Charts

These charts are different from those you see published elsewhere, and arguably more useful to the amateur fraternity as they give, effectively, the predicted signal/noise ratio for each hour and for selected bands.The charts are organised in 24 rows, one for each hour UTC (first column on the left). Don't forget to add the appropriate number of hours for your time zone, including daylight saving where it applies. The next column give the MUF (maximum usable frequency) for each hour, followed by the field strength at the MUF, in decibels referred to 1 uV/metre (dBU) The column marked FOT gives the "optimum" frequency - the most reliable frequency for the path. Then come five columns, one for each of five selected HF bands. The numbers in the column represent predicted field strength at each hour in decibels referred to 1 uV/metre. Here it represents "raw" signal to noise ratio as urban noise levels are typically 1-2 uV/metre, but does not take into account the advantage offered by particular transmission modes. The results are based on a transmitter power of 100 W output, the use of modest 3-element beams or similar, and for "median" conditions. Where the results fall below -40 dB, no output is printed

Enhanced conditions may improve S/N ratios by 9-15 dB. The use of CW or digital transmission modes show better results than SSB If you've got 400 W output, you get a 6 dB improvements. Where conditions warrant it, I have deleted 28.5 MHz predictions and included 10.1 MHz. I general, providing predictions for the band below 10 MHz is futile during this part of the solar cycle, except perhaps where DXpeditions are concerned.

The Bouvet Island predictions are different, being based on dipole antenna systems and they cover the bands scheduled to be activated The predictions are calculated using a program known as "FTZ", for IBMs and compatibles, distributed by FT Promotions. If you want to know more about this program, call (02)818-4838. **ar**

VK EAST — AFRICA

UTC	MUF	DBU	SOT	14.2	18.1	21.2	24.9	28.5
1	16.7	-3	12.2	-7	-3	-6	-12	-22
2	18.0	-4	13.8	-12	-4	-4	-8	-14
3	17.6	-9	13.4	-19	-8	-7	-10	-16
4	21.3	-7	16.2	-29	-12	-7	-6	-9
5	29.1	-2	22.5	+40	-16	-8	-3	-2
6	35.2	-2	25.9	...	-19	-8	+2	0
7	35 2	-1	26.5	...	-18	-8	-2	0
8	33 0	-1	26.3	-37	-14	+5	-1	1
9	30.0	-1	23.6	-29	-10	-3	0	0
10	26.7	-1	21.0	+21	-6	-1	0	+2
11	23 4	0	18.4	-13	-2	0	-1	-5
12	20 4	0	16.1	-6	0	0	-4	-10
13	18.4	3	14.5	.	3	0	-6	-15
14	17.2	7	13.5	8	6	1	-8	-19
15	16.4	12	12.9	15	8	1	-10	-23
16	16.0	13	12.5	16	9	1	-11	-25
17	15.5	15	12.0	17	8	0	-13	-28
18	14 7	16	11.2	17	7	-3	-17	-33
19	13.9	16	10.6	16	5	-6	-22	-39
20	14 7	16	10 9	17	7	-3	-17	33
21	14 7	15	10 2	16	6	-4	-10	-35
22	14.0	10	9 8	10	2	-8	-22	-38
23	13 3	2	9.4	2	-3	-12	-25	...
24	14.1	-2	10.2	-2	-4	-10	-21	-34

VK STH — AFRICA

UTC	MUF	DBU	SOT	7.2	10.1	14.2	18.1	21.2
1	15.8	-13	10.8	..	-23	-13	-15	+21
2	17 4	-14	13.4	...	-35	16	-14	-16
3	17.0	-19	13.0	...	....	-24	-18	-19
4	20.6	-18	15.6	...	....	-32	-21	-18
5	28.1	-15	21 7	...	....	....	-24	-17
6	32.8	15	23 6	...	....	....	-26	-18
7	31 7	-16	22 6	...	....	..	-27	-19
8	30.1	-16	23 2	...	....	..	-25	-18
9	27.5	-16	20.4	...	....	-29	-22	-17
10	24.7	-16	17.2	...	....	-32	-19	-16
11	21.6	-16	15.0	...	....	-26	-17	-16
12	19.0	-15	13.1	...	....	-19	-15	-17
13	17 1	-13	11.7	.	-26	-13	-13	-18
14	15 7	-9	10.8	-35	-14	-8	-13	-20
15	14 9	-4	10.4	-8	0	-3	-11	-21
16	14 5	2	10.0	0	3	-2	-12	-22
17	13.7	-1	9.6	5	5	-2	-14	-26
18	13.2	0	9.4	8	6	-3	-16	-29
19	12 5	1	9 0	9	6	-4	-18	-32
20	13.3	1	9.7	10	8	-2	-15	-28
21	14.0	1	9.8	11	9	0	-12	-24
22	13.4	-1	9.5	4	5	-3	-15	-27
23	12.7	-6	9 1	-13	-5	-8	-19	-31
24	13.5	-11	9.8	-32	-14	-11	-18	-28

VK WEST — AFRICA

UTC	MUF	DBU	FOT	14 2	18.1	21.2	24.9	28.5
1	15.5	7	11 8	8	4	-3	-15	-28
2	18 0	5	13 8	4	5	2	-5	-14
3	21.8	3	17.3	-1	4	4	1	+5
4	29 8	3	23 1	-14	0	4	6	4
5	36.7	2	28.6	-25	+6	1	5	6
6	38.1	1	31 4	-31	-10	-1	4	5
7	37.7	0	31.2	36	-11	-2	3	4
8	36.9	0	30.2	-34	-11	-3	3	4
9	35.5	0	28.7	-31	-10	-2	3	4
10	33 2	1	26 6	-24	-6	1	4	4
11	30 1	2	25.5	-14	-1	4	5	3
12	26.7	3	23.1	-4	5	6	5	1
13	23 4	5	18.5	5	8	7	3	-3
14	20 4	8	16 1	12	11	7	0	-9
15	18 5	12	14.6	19	13	6	-4	-15
16	17 2	14	13.6	19	12	4	-8	-21
17	16 4	15	13.0	19	11	2	-11	-25
18	16.1	15	12.6	20	10	1	-12	-27
19	15 7	16	12 2	18	9	0	-14	-30
20	16.9	16	11 4	18	7	-3	-18	-35
21	16.1	16	10 7	16	5	-7	-23	...
22	16 9	16	11 3	18	7	-3	-18	+35
23	15.6	16	12 0	18	10	0	-13	-28
24	14.7	14	11 2	15	6	-4	-18	-34

VK EAST — ASIA

UTC	MUF	DBU	SOT	14.2	18.1	21.2	24.9	28.5
1	34.2	3	28.3	-23	-4	3	6	7
2	34 4	3	26.2	-26	-6	2	6	6
3	34.5	3	27.1	-26	-6	3	5	6
4	34.3	3	28 4	-25	-5	2	6	6
5	33.9	3	27.8	+21	-3	3	7	7
6	33.0	4	26.8	-16	0	5	8	7
7	31 1	4	25.2	-7	5	8	9	7
8	28.3	6	24.7	7	13	13	11	7
9	27 4	9	21.8	23	22	19	14	7
10	25.3	10	20 1	26	22	18	11	3
11	23 6	10	18.8	26	21	16	7	+2
12	22.6	11	17.9	26	20	14	5	-6
13	21.7	11	17 2	26	19	12	2	-9
14	20.8	11	16 6	25	18	10	-1	+13
15	19.5	11	15.3	24	15	6	+6	+20
16	18 5	11	14.5	22	12	3	+11	-26
17	16.9	11	13.2	19	8	-4	-20	-37
18	15.1	11	11.7	14	0	+13	-33	. .
19	15.0	11	11.5	14	0	+15	-34	...
20	18 1	11	14.4	21	11	1	+13	+29
21	22.1	9	17.5	18	15	11	3	-6
22	29 6	6	23.0	0	9	11	10	7
23	33.0	4	26.4	+11	3	8	9	8
24	33 7	4	27.4	+18	-1	5	7	7

VK STH — ASIA

UTC	MUF	DBU	SOT	14.2	18.1	21.2	24.9	28.5
1	35.8	3	29.1	+29	+6	1	5	6
2	36.7	3	30.4	+30	+9	0	5	6
3	36.5	3	27.9	+32	+9	+1	5	6
4	36.4	3	30 4	+31	+9	0	5	6
5	36 2	3	30.0	+28	+7	1	5	7
6	35 5	3	29.1	+22	+4	3	7	7
7	34 1	4	27 6	+14	3	7	9	8
8	31 9	5	25 6	0	9	12	11	9
9	29 0	8	23 0	20	20	18	14	9
10	26.0	8	20 6	24	21	17	11	3
11	23.1	9	18.3	24	19	13	4	-6
12	20.4	9	16.2	22	15	7	-4	-17
13	18.8	9	14.9	20	11	2	-12	-27
14	17.8	9	14.1	19	8	+2	-17	-34
15	17.0	9	13.4	18	6	+6	+22	+40
16	16.6	9	13 0	17	4	+8	-25	...
17	16 2	9	12 6	16	3	+10	+28	...
18	15 2	9	11 7	13	+2	+16	-36	...
19	14 1	9	10 8	9	+7	+24	...	...
20	14 8	9	11 2	11	+4	+19	+40	...
21	18.0	9	13 6	20	9	+1	+16	+32
22	24.3	2	18.7	+1	5	4	1	-5
23	30 4	2	22 8	+12	1	5	6	4
24	34.3	3	27.4	+21	+3	3	6	6

VK WEST — ASIA

UTC	MUF	DBU	FOT	14.2	18.1	21.2	24.9	28.5
1	31.8	3	25.4	+16	-1	5	7	6
2	33.7	3	26.8	+21	-3	3	6	6
3	33.3	3	27.6	+24	+5	2	5	6
4	33 5	3	25.5	+25	+5	2	5	5
5	33 5	3	28 0	+24	+5	2	6	6
6	33.2	3	27.4	+21	-3	3	6	6
7	32 7	4	26.8	+16	0	5	8	7
8	31.6	4	25.7	+8	4	8	9	7
9	29.8	5	24.0	3	11	12	11	7
10	27.6	8	23.3	18	19	17	12	6
11	25.9	8	20.1	21	19	15	9	1
12	23.0	8	18 3	22	18	12	4	+6
13	21.0	9	16.7	22	16	8	-2	-14
14	19.8	10	15.7	23	15	6	-7	+21
15	19.0	10	15 1	22	12	3	-11	+26
16	18.2	10	14.5	21	10	0	-15	-32
17	17.4	10	13.7	19	7	+4	+20	-38
18	16.7	9	13.0	17	5	+8	-25	...
19	15.4	9	12.0	14	+1	+15	-35	...
20	14.0	9	10.8	9	+9	+26	...	...
21	14.2	9	10.9	9	+8	+24	...	...
22	17.3	6	13.7	12	3	+7	+21	-38
23	23.3	2	18.0	0	5	4	+1	-8
24	28.7	3	22.6	+9	3	6	6	3

VK EAST — EUROPE S.P.

UTC	MUF	DBU	SOT	14.2	18.1	21.2	24.9	28.5
1	16.4	-19	11.9	-28	-15	-13	-14	-20
2	15.8	-25	11.6	-34	-18	-14	-15	-20
3	16.4	-27	12.2	-40	-21	-15	-15	-19
4	18.5	-23	13.0	. .	-24	-16	-14	-15
5	22 2	+16	14.7	...	-29	-19	-13	-12
6	25.8	-11	19 4	...	-32	-20	-12	-9
7	28.8	-7	21.7	..	-32	-19	-10	-7
8	30.2	-4	22.8	...	-27	-15	-7	-4
9	31.0	-1	23 7	...	-20	-10	-3	-1
10	28.8	0	22.9	+34	+13	-6	+1	0
11	26 5	1	21.0	-21	-5	0	1	1
12	24 5	3	19 5	-10	1	3	2	+1
13	23 3	5	18.5	+1	5	6	3	-2
14	22.5	7	17.8	7	10	8	4	+3
15	21.5	9	17 0	12	12	9	3	-5
16	20 3	11	15.9	18	14	9	2	+8
17	19.3	13	15 1	20	15	9	-1	-11
18	17 8	14	13 8	20	13	5	-6	-18
19	16 0	15	12.3	18	9	0	-14	-28
20	15.9	15	12.2	19	8	0	-14	-28
21	19.2	14	13.5	22	16	8	+1	-12
22	18 3	7	13 1	9	8	3	+5	-16
23	17.8	-2	12.6	+7	+2	+4	+9	-17
24	17.4	-10	12.4	-19	-9	-8	-12	-18

VK STH — EUROPE S.P.

UTC	MUF	DBU	SOT	14 2	18.1	21.2	24.9	28.5
1	17.4	-9	12.6	-18	-6	-7	-11	-18
2	16.7	-16	12.1	+29	-15	-12	-13	-19
3	17.3	-21	12.7	-37	-19	-14	-13	-17
4	19.9	-19	13.6	...	-34	-16	-12	-13
5	24.0	-13	17.8	...	-31	-19	-12	-10
6	28.1	-8	20.9	...	-35	-21	-12	-8
7	31.3	-5	23.2	.	-37	-21	-11	-6
8	31 9	-4	24 4		-34	-19	-10	-4
9	28 9	-5	24.5		-27	-15	-8	-3
10	25 6	-6	20 3	...	-19	-11	-6	-4
11	22.4	-6	17.7	+30	+12	+7	+6	+8
12	19.6	+4	15.5	-19	-7	-6	+8	-13
13	17 8	-3	14.0	-9	-3	-5	-10	-19
14	16.6	0	13.1	-1	0	+5	+13	+24
15	15 9	4	12 6	5	2	-5	-16	-29
16	15.7	9	12.3	11	4	-4	-17	-32
17	15.3	12	11.9	14	5	-5	-19	-36
18	14.5	13	11.2	14	3	+8	+24	
19	13 7	14	10.4	13	0	-13	-31	
20	14.5	14	11.0	15	3	+8	-25	.
21	17.6	14	13.9	21	13	6	+8	+21
22	18.5	14	13.7	22	16	10	1	-10
23	18.9	8	13.1	19	9	5	+3	+13
24	18.5	9	13.0	+4	1	+1	+7	-15

VK WEST — EUROPE S.P.

UTC	MUF	DBU	FOT	14.2	18.1	21.2	24.9	28.5
1	17.9	0	12.7	-2	0	-3	-10	-18
2	17.2	-9	12.3	-16	-8	-9	-13	-21
3	17.9	-14	13.0	-27	-14	-11	-13	-19
4	20.5	-14	13.8	-39	-19	-13	-11	-14
5	25.0	-10	18.4	...	-26	-15	-10	-8
6	29.3	-6	21.6	...	-30	-18	-10	+7
7	32 6	-4	24 1	...	-33	-19	-10	+5
8	34.1	-3	25 2	...	-33	-19	-9	-4
9	34.8	-3	26.0	...	-31	-17	-8	-4
10	32.7	-3	26.2	...	-25	-13	-6	-3
11	30.0	-2	23 9	+40	-17	-8	-3	-2
12	27.3	-1	21.7	-25	-8	-3	0	-2
13	24.6	1	19.6	-12	-1	1	0	+3
14	22.3	3	17 7	0	5	4	0	+6
15	20.8	6	16.5	8	8	5	+1	-10
16	19 9	9	15.7	15	12	6	-2	-12
17	19 1	11	15.1	18	13	6	-4	-15
18	18.4	12	14 4	19	12	5	+5	-19
19	17.7	12	13.8	20	12	3	-9	-22
20	16 5	13	12.8	18	9	-1	+14	+30
21	15.1	13	11.6	15	4	+7	+22	+40
22	15.5	13	11.9	16	6	+5	-20	-37
23	18 9	12	13.4	22	14	7	+4	+16
24	19.0	9	13.3	14	11	5	+4	-14

VK EAST — NTH/CENT AMERICA

UTC	MUF	DBU	SOT	14.2	18.1	21.2	24.9	28.5
1	34 0	0	28.0	...	-24	-12	-4	-1
2	31.8	1	25.2	-38	-14	-5	0	1
3	29.8	2	23.6	-23	-6	0	3	3
4	27.8	5	22 0	-7	4	7	7	4
5	26.8	8	21.2	7	12	12	10	6
6	25 9	11	20 4	20	19	17	13	7
7	24.9	13	19.8	26	22	18	13	6
8	23.6	13	18.5	25	22	17	11	4
9	22.6	14	17.6	26	21	16	9	1
10	20.8	15	16.1	25	20	14	6	-4
11	19.3	15	14.8	24	19	11	2	-9
12	19 4	15	14.8	24	18	11	2	-9
13	21.2	12	16.8	22	18	12	4	-5
14	20 0	9	15.7	14	12	7	-1	-10
15	19.0	4	14 8	4	5	2	+5	14
16	17 5	-4	13.6	-8	-4	-5	+11	-19
17	15 8	-14	12.1	-19	-11	-11	-16	-25
18	15 8	-20	12.1	-27	-15	-13	-17	-23
19	19.2	-16	15.2	-38	-19	-13	-12	-15
20	26 .	-8	20.1	. .	-25	-15	+9	-8
21	32 3	-4	25.3	...	-31	-16	-9	-5
22	33.6	-2	25.8	. .	-34	+19	-9	-4
23	33.3	-2	27.8	...	-33	-19	-9	-4
24	33.5	-1	27.7	. .	-30	-16	-7	-3

VK STH — NTH/CENT AMERICA

UTC	MUF	DBU	SOT	14.2	18.1	21.2	24.9	28.5
1	35.3	1	28.3	...	-23	-10	-3	1
2	33.4	3	26.5	-36	-13	+3	2	4
3	31.6	5	25.1	-19	-3	3	6	6
4	29.9	7	23.7	-3	7	10	10	8
5	29 1	10	23.0	11	16	16	14	10
6	28.3	12	22.4	21	21	20	16	12
7	27.3	11	21.7	25	24	21	16	11
8	25.6	13	20.1	26	23	20	14	8
9	23.3	12	18.4	26	21	16	9	0
10	20.3	13	16.0	24	17	11	2	-9
11	18.3	13	14.5	22	14	6	-5	-17
12	17.1	14	13.5	20	11	2	+10	+24
13	16.3	12	12.9	16	8	-1	+14	+29
14	16.0	7	12.5	8	3	-4	+16	-29
15	15.5	0	12.0	-1	-2	+8	+18	-30
16	14.7	-11	11.3	-12	-9	-12	-20	-32
17	13.8	-21	10.5	-19	-13	-15	-22	-33
18	14.6	-24	11.3	-26	-15	-15	-19	27
19	17.8	-19	14 0	35	-18	-14	-14	-18
20	23.7	-11	18.1	...	-24	-15	-10	-10
21	29.8	-4	23.2	. .	-30	-17	-9	-6
22	34.2	+4	27.2	..	-33	HIH	-9	-5
23	36.3	-2	29 4	...	-33	-18	-8	-4
24	36.8	-1	29.6	...	-30	-16	-6	-2

VK WEST — NTH/CENT AMERICA

UTC	MUF	DBU	SOT	14.1	18.1	21.2	24.9	28.5
1	34.1	-1	28.8	...	-34	-18	-8	-3
2	31.9	0	25.3	...	-24	-13	-5	-1
3	29.8	1	23.6	...	-18	-7	-1	1
4	27.7	3	21.9	-30	-9	-2	2	2
5	26.6	5	21.1	-15	0	4	5	4
6	25.7	8	20.3	-2	7	9	8	5
7	24.7	11	19.6	11	15	14	11	6
8	23.5	14	18.4	20	20	17	12	5
9	22 5	15	17.5	24	22	18	11	4
10	20.8	16	16.1	25	21	16	8	-1
11	19.4	17	14.9	25	20	14	5	-5
12	19.6	17	14.9	26	19	13	4	-6
13	18.2	15	14.4	21	15	8	-2	-14
14	17.1	13	13.5	13	9	3	-7	-18
15	16.4	4	13.0	6	3	+1	+10	-21
16	16.2	-3	12.7	-6	-2	-5	-11	-21
17	15 9	-10	12.4	-15	-7	-8	-13	-21
18	15.0	-18	11.6	-23	-12	-11	-15	-22
19	14.2	-28	10.8	-28	-15	-13	-16	-23
20	15.0	-29	11.4	-34	-17	-13	-15	-19
21	18 3	-21	14.5	...	-22	-15	-12	-14
22	24.6	-11	18.9	...	-30	-18	-11	-9
23	30 9	-5	24.1	...	-36	-21	-11	-6
24	35.1	-2	28.0	.	-38	-21	-10	-5

UTC	MUF	DBU	SOT	14.2	18.1	21.2	24.9	28.5
1	10.1	13	22.6	8	16	18	18	15
2	10.1	14	25 2	9	17	19	18	15
3	29.7	14	24.6	11	18	19	18	15
4	29.2	15	23 9	14	20	20	19	15
5	28.1	16	22 6	19	23	22	19	[illegible]
6	26 4	18	21.3	27	27	25	20	16
7	24 4	20	19 8	32	29	25	19	11
8	22.2	21	17.7	32	28	23	15	6
9	20 0	22	15 9	31	25	18	10	-1
10	18.1	23	14.4	30	23	15	4	-9
11	16 9	24	13 4	29	20	11	-1	-14
12	16.0	24	12 7	28	18	8	-5	-19
13	15.2	24	12.1	27	15	6	-9	-24
14	14.6	24	11 5	25	14	3	-12	-28
15	14.0	25	11 0	24	12	0	-15	-32
16	13 1	25	10 1	22	8	-5	-21	-40
17	12.0	25	9.2	18	3	-11	-30	...
18	12.2	25	9 3	13	4	-9	-28	...
19	14.8	21	11 5	22	13	3	-11	-26
20	20.0	17	15.4	20	19	15	7	+3
21	24 9	15	19.6	15	19	18	15	9
22	28.0	14	22.3	12	18	19	17	13
23	29.1	14	23.7	10	17	18	17	14
24	29.9	13	23.2	8	16	18	16	15

VK EAST — STH PACIFIC

UTC	MUF	DBU	SOT	14.2	18.1	21.2	24.9	28.5
1	17.1	5	13.6	6	3	-3	-14	-27
2	18.3	4	14.6	5	5	0	-9	-20
3	19.3	4	15.4	6	5	1	-6	-16
4	19.8	4	15.8	6	5	3	-4	-13
5	20.1	5	16.0	6	6	3	-3	-12
6	20.3	6	16.2	6	8	5	-2	-11
7	20.5	7	16.3	10	10	6	-1	-10
8	20.5	11	16.2	12	14	9	1	-10
9	20.2	13	15.9	23	17	11	1	-10
10	19.8	14	15.6	24	17	10	0	-12
11	19.0	14	14.4	24	16	8	-4	-17
12	17.9	12	12.7	21	11	1	-13	-30
13	16.1	12	11.4	18	5	-7	-24	...
14	14.8	12	10.4	15	0	-14	-34	...
15	14.0	13	9.8	12	-4	-19	..	...
16	13.6	13	9.7	11	-6	-22	...	...
17	12.8	13	9.2	7	-11	-29	...	...
18	12.4	13	9.0	6	-14	33	...	...
19	11.8	13	8.7	3	-18	-39	...	...
20	12.4	13	9.3	6	-14	-32	...	...
21	12.9	13	9.9	8	-10	-26	...	...
22	13.7	12	10.8	11	-4	-18	-39	...
23	14.5	8	11.1	9	-1	-13	-30	...
24	15.7	5	12.5	7	1	-8	-21	-37

VK STH — VK ANTARCTIC

UTC	MUF	DBU	SOT	14.1	18.1	21.2	24.9	28.5
1	24.3	7	18.8	7	11	10	7	2
2	21.5	0	16.5	-10	-1	7	-2	-7
3	20.7	-7	15.8	-25	-10	-6	-7	-11
4	24.6	-6	18.6	-39	-17	-9	-6	-6
5	31.5	-2	24.2		-25	-13	-6	-3
6	37.8	0	29.6	...	-30	-15	-6	-1
7	38.6	-1	29.6	...	-32	-17	-7	-2
8	38.0	-1	31 1	..	-31	-17	-7	-2
9	36.6	2	29.7	....	-29	-15	-6	-2
10	34.4	-2	27 6	...	-23	-12	-4	-1
11	31.5	-1	26.6	-40	-16	-7	-2	0
12	28.6	0	22.7	-25	-7	-1	1	0
13	25.7	1	20.3	-12	0	3	2	1
14	23 1	4	18.3	1	6	6	2	-4
15	21.5	7	17 0	11	11	8	1	-7
16	20.5	10	16.2	18	14	9	1	-9
17	19.7	11	15.7	20	14	8	-1	-12
18	19.0	12	14 9	21	14	7	-3	-15
19	18 4	13	14 3	21	14	6	-5	-18
20	17.1	13	13.3	20	11	2	-10	-24
21	15.8	14	12.1	18	7	-1	-17	-33
22	14.2	14	12.4	16	8	-1	-14	-30
23	19.8	13	15.7	23	16	10	0	-11
24	23.0	13	17.7	20	18	15	9	2

VK WEST — MEDITERRANEAN

UTC	MUF	DBU	SOT	14.2	18.1	21.2	24.9	28.5
1	19.2	-6	12.9	-14	-6	-4	-6	-11
2	18.6	-2	13.7	-9	-1	-2	-6	-13
3	18.2	0	13.6	-4	0	-1	-4	-14
4	17.2	3	13.1	1	2	-1	-8	-17
5	16.6	7	11.8	8	5	0	-9	-20
6	17.1	8	12.4	10	7	2	-7	-17
7	18.5	8	14.3	11	10	6	-1	-9
8	23.4	7	17.1	7	10	9	5	0
9	22.3	4	17.1	-3	4	4	2	+2
10	20.4	-4	16.0	-16	-6	-4	-5	-10
11	18.4	-12	14.5	-26	-13	-8	-10	-14
12	17.1	-20	13.5	-33	-17	-13	-11	-17
13	16.3	-27	12 8	-38	-20	-15	-14	-18
14	15.9	-31	12.4	...	-22	-16	-15	-18
15	15.4	-35	12.0	...	-24	-17	-15	-18
16	14.6	-40	11.2	...	-23	-17	-16	-18
17	13.8	...	10.5	...	-24	-20	-19	-22
18	14.6	-40	11.0	...	-23	-17	-16	-18
19	17.7	-27	13.9		-26	-18	-15	-16
20	23.5	-13	17.9	...	-27	-17	-12	-10
21	25.4	-6	17.3	...	-24	-14	-9	-7
22	23.0	-8	15.7	-38	-17	-10	-7	-8
23	21.4	-7	14.5	-28	-12	-7	-6	-9
24	20.1	-6	13.6	-21	-8	-5	-6	-10

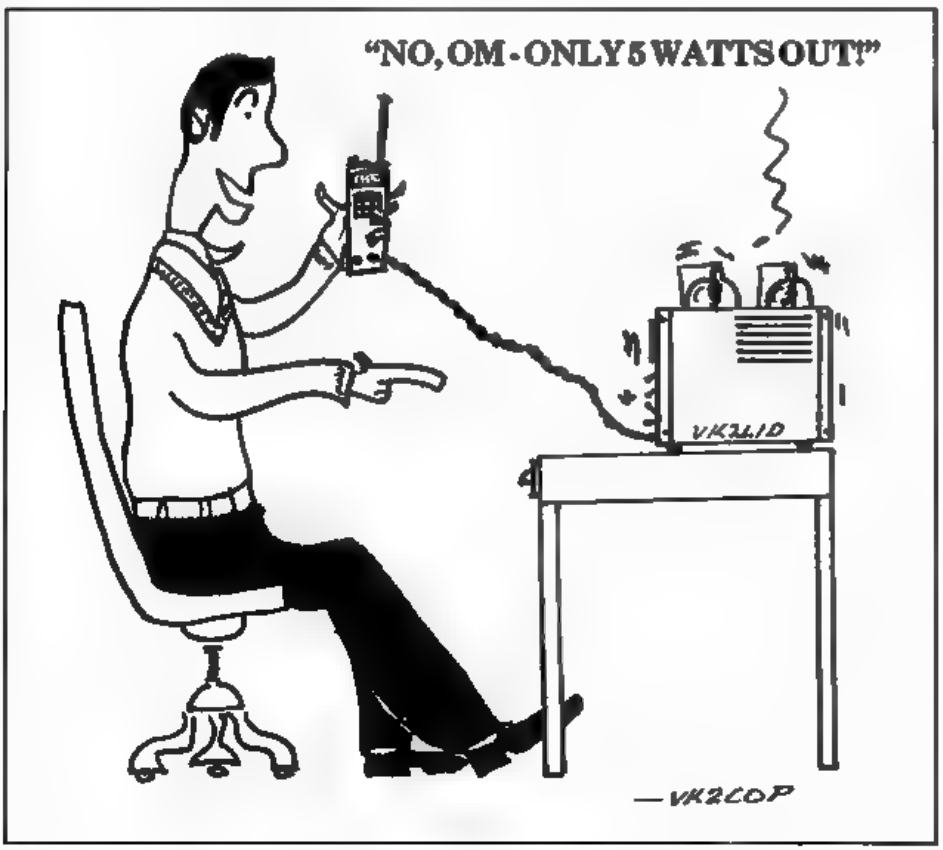
VK EAST — EUROPE L.P.

UTC	MUF	DBU	SOT	14.2	18.1	21.2	24.9	28.5
1	18.0	-9	12.4	-18	-8	-7	-10	-16
2	17.4	-6	12.1	-10	-5	-5	-10	-19
3	17.0	-1	12.0	-4	-2	-4	-11	-30
4	16.1	1	11.5	1	0	-5	-13	-36
5	15.6	6	11.3	6	2	-4	-15	-28
6	16.1	7	11.8	9	6	-2	-13	-25
7	18.0	7	13.4	10	7	2	-6	-16
8	21.3	7	15.9	9	10	7	2	-5
9	22.6	4	15.7	3	7	6	2	-4
10	19.8	-2	13.7	-9	-2	-2	-6	-13
11	17.8	-9	12.2	-16	-9	-8	-11	-17
12	16.4	-17	11.2	-25	-14	-12	-14	-20
13	15.5	-25	10.8	-31	-17	-14	-16	-21
14	15.1	-30	10.5	-36	-20	-15	-16	-20
15	14.5	-36	10.1	-38	-21	-16	-16	-20
16	13.8	...	9.8	...	-38	-23	-23	-27
17	13.1	...	9.4	. .	-37	-31	-31	-36
18	13.9	...	10.1	....	-33	-27	-26	-30
19	16.4	-32	11 2	..	-25	-18	-15	-17
20	21.0	-20	15.6	....	-30	-20	-14	-14
21	23.7	-14	16.5	....	-30	-19	-13	-11
22	21.5	-15	15.0	....	-25	-16	-12	-12
23	20.0	-14	13.8	-38	-19	-13	-11	-13
24	18.7	-12	12.9	-27	-13	-10	-10	-14

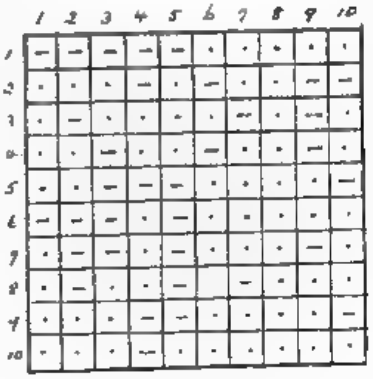
VK STH — EUROPE L.P.

UTC	MUF	DBU	SOT	14.2	18.1	21.2	24.9	28.5
1	17.5	-19	12.1	-32	-18	-14	-15	-19
2	16.9	-16	11.9	-24	-14	-12	-15	-21
3	16.5	-13	11.8	-19	-11	-11	-13	-22
4	15.7	-11	11.3	-14	-8	-11	-17	-26
5	15.2	-8	11.2	-8	-7	-11	-18	-29
6	15.7	-5	11.6	-6	-5	-8	-17	-27
7	17.5	-2	13.1	-4	-2	-5	-11	-20
8	20.3	1	15.3	+2	2	0	-4	-11
9	23.5	2	17.6	+2	3	3	0	-4
10	25.0	1	19.7	-7	1	2	1	+2
11	22.6	-4	17.8	-18	-7	-4	-5	-9
12	19.7	-12	15.6	-27	-14	-11	-11	-15
13	17.7	-20	14.0	-34	-19	-15	-15	-19
14	16.4	-26	12.9	-39	-22	-17	-17	-20
15	15.5	-34	12.2	...	-24	-19	-18	-21
16	15.2	-39	11.8	...	-25	-19	-18	-20
17	14.5	...	11.2	...	-31	-24	-22	-25
18	13.8	...	10.6	...	-36	-28	-28	-31
19	11.1	...	10.0	...	-38	-32	-32	-36
20	13.0	...	10.5	...	-33	-27	-25	-29
21	16.5	-34	13.0	...	-27	-20	-18	-19
22	20.9	-23	14.7	...	-31	-21	-16	-16
23	19.4	-23	13.6	...	-27	-19	-16	-16
24	18.2	-22	12.7	-40	-22	-16	-15	-19

VK WEST — EUROPE L.P.



Solution to Morseword No 36



Across: 1 tones, 2 skim, 3 like, 4 fain; 5 24; 6 ores, 7 write; 8 rams, 9 34, 10 vies.

Down 1 Beth, 2 cage; 3 dots, 4 grew, 5 bog; 6 entire, 7 and 8 Isis, 9 agree; 10 rave

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HOMEMADE oscilloscope (DG7-6), circuit $120 pick up. High-low pass split filter 5000 Watt HARO-ELECTRONIC/Germany — 70 dB gold terminals, silver tub coils ceramic capacitors. $50. VK2AOU QTHR (02) 53 9789.

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YAESU FTONE vgc full manuals filters $1750 also EMTRON tuner EAT300A vgc $250. George VK2EHN QTHR (043) 69 2896

STANDARD C146A 2 metre 5 channel FM handheld TXVR including nicads, leather carrycase, technical manual, full circuit diagram. Excellent condition. $250 ono. VK2DEQ QTHR (063) 62 8703

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DRAKE TR7A transceiver 250 w HF 1.5 — 30 MHz with aux 7 marine mint condition manuals carton $1500 Max VK2TX (043) 62 1919 QTHR.

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YAESU FT101E HF transceiver includes manuals and inverter. Excellent condition. $450. Ph (054) 61 4001. QTHR VK3KQI.

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AZDEN PCS 4000 2 metre mobile transceiver 5 or 25 w 16 memories reverse backlit dial no mods new condition instruction book carton $400. Alf VK3EJ (03) 877 2983.

COMMUNICATIONS RX LAFAYETTE HA 800 80 through 6 metre amateur bands $100. Leo VK3YX QTHR (03) 232 9422.

FT7 $370 FL110 $220 FRG7 $220. (Manuals included.) Buyer to collect from Bendigo or Melbourne. Max VK3ATK (054) 41 2158 or (03) 563 3080

YAESU FT757GX ex cond $1300. YAESU FP757HD power supply $450. PLESSEY FOSTER hand held power mikes (2) brand new $60 each. Kevin VK3CKL (03) 792 9503

WESTON milliamp DC meter, mode. 430, resist 10 ohms, zero corrector $95. WESTON current transformer, model 539, cap 2v amps, freq 25-150, line-volts 750. Ranges 20, 10, 5, 2, higher ranges $150 ono. (055) 62 6016.

TRAP dipole 40 80 meters "RAKE" $25 Ted VK3TG (052) 59 3225.

YAESU FT-480R 2m all-mode transceiver with four memories and scan functions. Complete with owners manual, service manual and accessories $495. Adrian VK3DAW Ph (03) 720 6451.

YAESU FT-209RH 2m hand held and accessories $350. Bert VK3TU Ph (052) 76 2374 QTHR.

ICOM auto antenna tuner AT500 $1000 John (03) 232 6587 AH (03) 794 8077 Bus.

YAESU FTV-650B 6m SSB transverter. Matches FT-101 series transceivers $150. VK3BRZ (AH) (052) 82 3167.

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VOLTOHMIST probe set, will accept individual probes. Model number 2A56074 please advise cost David Kidd 8 Gosse Ave Dubbo East (068) 81 8906.

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ICOM22S, manual & modifications for copying. Pay costs. David Aston VK3THY. Ph (03) 434

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TUBES 6L7 6K7 6J7 6SJ7 for Super Pro receiver. Ph (07) 390 7762.

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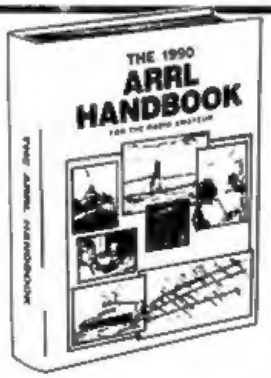

Just released, this quality hard cover edition of the ARRL handbook is a MUST for every Ham shack. It covers all aspects of Amateur operations, including up-to-date information on Satellite and digital mode techniques, as well as many chapters of constructional projects for the home-brew enthusiast.

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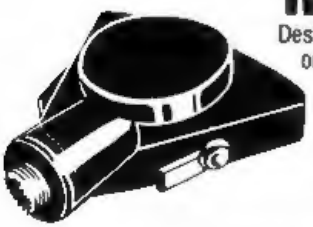

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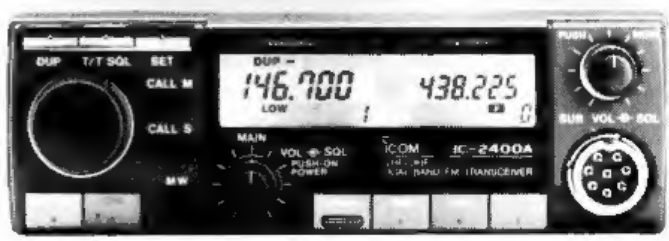
IC228A



IC2400A

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